ARCS - 10 7 - D253-40-B14-0003

JACOBS ENGINEERING GROUP INC.

8208 MELROSE DRIVE, SUITE 210, LENEXA, KANSAS 66214
TELEPHONE (913) 492-9218 • FAX (913) 492-6198

April 5, 1995

Ms. Anne Olberding
Site Assessment Manager
U.S. Environmental Protection Agency
Region VII, Superfund Division
726 Minnesota Avenue
Kansas City, Kansas 66101

Re: EPA Contract No. 68-W8-0122
Final Site Inspection Prioritization Report
for the Deer Valley Site
Florissant, Missouri
CERCLIS No. MOD981712011
EPA Work Assignment No. 53-7JZZ
Jacobs Project No. 12-D253-40

Dear Ms. Olberding:

Jacobs Engineering Group Inc. (Jacobs) was tasked by the U.S. Environmental Protection Agency (EPA) to evaluate the Deer Valley Site (CERCLIS No. MOD981712011), Florissant, Missouri (Figure 1) as a potential candidate for an Expanded Site Inspection (ESI) under the Site Inspection Prioritization (SIP) guidelines. The evaluation included a review of EPA and state file material and a review of potential contaminant receptor information. The EPA review comments from the Draft SIP have been incorporated into the Final SIP. The Final SIP Report is included as an attachment to this letter.

SITE BACKGROUND

The site is located near Florissant, St. Louis County, Missouri (Figure 1). The site can be reached by taking Highway 67 north (Lindbergh Boulevard) from I-270, approximately six miles to Jamestown Sports Complex. After turning left at the Sports Complex and left again at Whiting Roll-up Doors, the site is located north of the Whiting Roll-up Doors' property. The geographical co-ordinates of the site are 38°49'20" North latitude and 90°16'04" West longitude. The legal description of the site is as follows: northwest quarter of the northwest quarter of the northeast quarter of Section 18 and southwest quarter of the southwest quarter of the southeast quarter of Section 7, Township 47 north, Range 7 east.

The site is approximately 25 acres on the east side of the Deer Valley housing subdivision, north of Whiting Roll-up Doors (a truck door manufacturer) at 5015 North Highway 67, and west of the Jamestown Sports Complex (an indoor soccer facility) (Figure 2). The site was discovered in December 1986 through a complaint to state authorities from a potential property buyer.

A Preliminary Assessment (PA) was conducted on the site on December 19, 1986 by Missouri Department of Natural Resources (MDNR). The purpose of this investigation was to collect information concerning conditions at the site sufficient to assess the potential for adverse effects to human health and the environment resulting from contaminants associated with the site and to determine the possible need for additional action. Preliminary investigations regarding the location of the site conducted by MDNR during the December 1986 PA revealed that the site was not located in the property boundaries of Deer Valley housing board, but was included in the adjacent property owned by

Teamsters' Local No. 682, Health and Welfare Trust Fund. Observations made by MDNR during the investigation indicated the presence of approximately 50 exposed drums. The exposed drums were identified by MDNR as follows:

Petrolite Corporation	22 Drums
Schenectady Chemicals, Inc.	1 Drum
Dow Chemical	1 Drum
Unmarked	26 Drums

Additional observations by MDNR during the December 1986 investigation indicated an old brick kiln structure (lined inside with concrete), about 100 feet east-northeast of the Whiting building (Figure 2), possibly used by previous occupants to incinerate residues in the drum reconditioning business. Ashes and cinders were observed by MDNR adjacent to the kiln on the south and east sides, along with a few drum heads.

On January 8, 1987, a second site visit was conducted by MDNR. Representatives from the Petrolite Corporation were also present to inspect the "Petrolite" drums. After examining the drums and researching company files, the Director of Health, Safety, and Environmental Affairs at Petrolite stated that the drums had contained phenolic formaldehyde resins in aromatic hydrocarbons, used as de-emulsifiers in oil production. Evidently, some of the product was returned to Petrolite at some time in the 1960s by a customer due to polymerization which prevented its use. After Petrolite recovered any free liquids, the drums were discarded by Petrolite. The Petrolite representative was unable to determine how the drums were discarded, but sale to a drum reconditioner was considered by Petrolite as a likely answer.

Based on the observations made by MDNR during the December 1986 and January 1987 investigations, MDNR recommended that drum contents, spill residues, and nearby soils be sampled, that a metal detection survey be conducted to determine the extent of drum burial, and that excavation of buried drums be performed to determine whether buried hazardous wastes are present.

On January 21, 1987, a limited site sampling was conducted by MDNR. Composite soil samples and samples of spill residues and "Petrolite" drum contents were collected during the January 1987 investigation. Most of the remaining drums on-site appeared to be empty; however, some of the drums were partially full, but the contents of the drums were frozen and could not be sampled by MDNR. The depths of composite soil samples are not known. Samples collected during the January 1987 investigation were analyzed for volatile organic compounds (VOC), Toxicity Extraction Procedure (TEP) metals, and flashpoint. Analytical results did not indicate the presence of any contaminants in the soil samples; however, one composite drum sample was determined by MDNR to be hazardous based on ignitability (flashpoint of 54°C).

On January 23, 1987, the Director of Petrolite requested permission from MDNR to remove drums from the site bearing the Petrolite labels. On February 24, 1987, MDNR approved that request, and on March 10, 1987, Petrolite removed a total of 22 drums from the site. The drums were removed from the site by Petrolite Corporation and temporarily stored at another Petrolite facility in Webster Groves, Missouri prior to off-site disposal as a hazardous waste.

On March 3, 1987, a metal detection survey of the property was conducted by MDNR to determine the presence of any buried drums on-site. The survey indicated the presence of buried metal in three areas of the site, although it was difficult to determine whether these were three distinct areas or portions of one area (Figure 3). A sinkhole was also documented to be present at the site between the potential drum disposal area "PBD-C" and an on-site pond; however, no other information is available on the sinkhole. Based on the metal detection readings, variations in the topography and vegetation on the site, as well as the presence of partially exposed drums, MDNR suspected that the site could contain a large number of buried drums.

MDNR suspected that one area of buried metal (potentially drums) extends onto the Whiting property, and that another such area existed on the property to the west of the Whiting property (Figure 3) based on the investigations conducted by MDNR during 1986 and 1987. According to MDNR, one area of partially buried drums lies along a ravine trending east to west, the majority of which lies on the property to the west of the site.

A summary of ownership history for the Deer Valley site property follows:

(1950s) - 1963
Mr. Frank E. Westerhold
F.E. Westerhold Cooperage Company
(address and current status of Mr. Westerhold unknown)

1963 - 1969
Mr. Robert G. Evans
Evans Steel Barrel, Inc.
P.O. Box 95
Harvey, Louisiana 70058

1969 - 1973
Mr. Lauren Whiting
Whiting Roll-Up Door Manufacturing Corp.
113 Cedar Street
Akron, New York 14001

1973 - present
Teamsters' Local No. 682, Health and Welfare Trust Fund
c/o Wiley, Craig, Armbruster & Wilburn
Suite 650, Shell Building
1221 Locust Street
St. Louis, Missouri 63103

On April 3, 1987, MDNR contacted Mr. Robert Evans, of Evans Steel Barrel, Inc., for information regarding his company's operations at the Deer Valley site. Mr. Evans informed MDNR that prior to 1963 the property was occupied by the F.E. Westerhold Cooperage Company, a drum reconditioning company owned and operated by Mr. Frank E. Westerhold. In 1963, Evans Steel Barrel, Inc. purchased the company and operated it as Westerhold Containers, Inc. until 1969. Westerhold Containers, Inc. purchased drums containing a wide range of product residues from many area businesses for reconditioning and resale. The company practice was to accept drums with only "limited quantities of material," although Mr. Evans admitted to MDNR that, due to the lack of hazardous waste regulations at that time, drums may have contained varying quantities of products. Mr. Evans informed MDNR that he could not recall the names of the companies from which drums were accepted.

Mr. Evans indicated to MDNR that the drum residues were hauled from the site for disposal, and unusable drums were sold to a scrap metal dealer. Mr. Evans could not recall the names of the firms which hauled residues from the site. Mr. Evans informed MDNR that he was not involved in the day-to-day operations of the facility and that there were several managers at the plant over the years it operated. Mr. Evans informed MDNR that he was unaware of any on-site waste disposal practice during the years Evans Steel Barrel Company owned the property. Mr. Evans also indicated to MDNR that he did not have any knowledge of waste management practices at the site prior to 1963. In 1969, the facility was sold to Whiting Roll-Up Doors.

In October 1987, the Teamsters' Local No. 682, current property owners since 1973 and a Potentially Responsible Party (PRP), hired Metcalf and Associates of St. Charles, Missouri to develop a Remedial Action Plan for the site. In December 1987, the PRP contractor, Metcalf and Associates, submitted a draft Remedial Investigation Plan to MDNR. MDNR recommended a few changes to the draft Remedial Action Plan after review. A revised plan incorporating MDNR's recommendations was submitted to MDNR by the PRP contractor on June 14, 1988. The revised plan was approved by MDNR on June 23, 1988.

The PRP contractor conducted a Remedial Investigation (RI), with MDNR oversight, in September 1988. A total of 32 borings were drilled around the site, resulting in 28 soil samples during the RI. For each sampling point, aliquots were obtained from two, four, six, eight, 10, and 12 feet. An upper (two to six feet) and/or lower (eight to 12 feet) composite was made for each sampling point. In addition to the 32 borings, four exploratory excavations were made. Several buried drums were uncovered and sampled during the RI. A sample from a water well serving the Whiting Roll-Up Door Manufacturing Co. facility was also collected. Samples collected during the RI were analyzed for total metals, TEP metals, pesticides, VOCs, and semi-VOCs.

Chlordane, chloroform, and heavy metals were detected in soil samples (Table 1). MDNR determined that a significant amount of the scrap metal on-site consisted of tracks from roll-up doors similar to the ones manufactured in the Whiting Roll-up Door facility.

MDNR contacted Mr. Lauren Whiting, owner of the Whiting Roll-Up Doors on September 16, 1988 regarding potential hazardous materials on Whiting Door property. Mr. Whiting informed MDNR that the Deer Valley site was owned and occupied by a drum reconditioning company in the past. Mr. Whiting indicated to MDNR that he purchased the property in 1969 and in 1973 sold it to the Teamsters' Local. Mr. Whiting also informed MDNR that he continued operations at the property and in 1978 purchased back a part of the property, approximately three acres, currently occupied by Whiting Roll-Up Doors facility.

In August 1989, a Site Investigation (SI) was performed by MDNR. The purpose of the SI was to perform oversight and review of the RI conducted by the PRP contractor. The samples were collected by the PRP contractor, however, MDNR collected the splits. A total of 28 sample splits were collected by MDNR during the SI. Of these 28 splits, 16 samples were submitted by MDNR for laboratory analysis. These 16 sample splits consisted of one groundwater, two drum contents, and 13 composite soil samples.

The water sample (Sample No. 88-1758) was collected from the Whiting well located on the property immediately south of the property owned by the Teamsters' Union (Figure 2). The sample was collected by MDNR from a sink faucet located in the Whiting Roll-Up Door Company office. Sample No. 88-1758 was analyzed for VOCs and total silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium. Carbon disulfide, 1,1-dichloroethane, and vinyl chloride were detected in the Sample No. 88-1758 (Table 2).

The drum contents sample splits (Sample Nos. 88-0698 and 88-0699) were collected by MDNR during the RI from drum No. 1 and drum No. 4 (Figure 3). MDNR intentionally unearthed these two drums and sampled them as part of the investigation process. Sample 88-0698 (drum No. 1) was analyzed for VOCs, flash point, total and TEP concentrations of silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium. Sample No. 88-0699 (drum No. 4) was analyzed for VOCs and pesticides. Acetone and styrene were detected in drum No. 1 at concentrations of 0.35 mg/kg and 2.0 mg/kg, respectively. Ethyl benzene was detected in drum No. 4 at a concentration of 2.50 mg/kg (Table 1).

Thirteen composite soil sample splits were collected by MDNR from potential areas of waste deposition. The sample material for each composite was collected using a trailer-mounted drill rig to auger and push a split spoon sampler to retrieve the sample. Metals including cadmium, lead, and mercury and organics including chlordane, chloroform,

methylene chloride, and toluene were detected in the composite soil samples. During the pesticide analyses of the soil samples, spikes typical to polychlorinated biphenyls (PCB) were identified; however, the samples were not specifically tested for PCBs. Based on this observation, PCBs are suspected to be present on-site.

The 1988 RI by the PRP contractor, with oversight by MDNR, recommended a complete removal of the buried wastes. The PRP did not act on this recommendation, but instead chose to conduct further investigation. Additional investigation was proposed by the PRP contractor, Metcalf and Associates, Inc. in the 1992 RI Work Plan. The purpose and scope of the 1992 RI Work Plan was to continue the work begun previously at the Deer Valley site. Further sampling and excavation were proposed by the PRP to determine the total amount of waste present and the environmental threat posed thereby.

The PRP requested MDNR oversight during the RI and cleanup activities. MDNR reviewed and commented on the Work Plan in February 1993.

Activities outlined in the RI Work Plan included: sampling and analysis of an ash bank that had been used as fill material in a gully, the bottom of the gully where empty chemical bottles were previously observed, and standing water in the pond and the sediment in the bottom of the pond; installation of groundwater monitoring wells and groundwater monitoring; and investigative excavation. Samples collected were to be analyzed for acidity, alkalinity, bicarbonate, carbonate chloride, chemical oxygen demand (COD), Toxicity Characteristic Leaching Procedure (TCLP) metals, nitrogen (ammonia, Kjeldahl nitrogen, total nitrate), oil and grease, sulfate, solids (total dissolved and total suspended), total organic carbon (TOC), and total organic halogen (TOH or TOX).

According to attorneys representing Teamster's Local No. 682, Health and Welfare Trust Fund, additional investigative activities were completed by the PRP contractor in October 1994 (conversation with Olberding 3/23/94). Results of this investigation have not been forwarded to MDNR or EPA as of March 23, 1995. MDNR is waiting for the PRPs to continue their voluntary cleanup program (Reference 15).

SOURCE(S)/WASTE CHARACTERISTICS

The potential sources of contamination at the site are buried drums (approximately 500, 55-gallon drums) containing an estimated 25,000 gallons and an area of contaminated soil approximately 25 acres in size. The sources were determined based on the history of the site (a drum reconditioning business in operation for at least 20 years), aerial photographs (showing several thousand drums and large areas of disturbed earth), and analytical results of the samples collected by the PRP contractor during the September 1988 RI.

The suspected wastes include various metals such as barium, lead, and silver, VOCs, including chloroform methylene chloride, 1,1-dichloroethane, acetone, carbon disulfide, vinyl chloride, styrene, and ethylbenzene. PCBs are also suspected to be present on-site, but this was not confirmed since none of the samples were analyzed for PCBs.

GROUNDWATER

Geology and Hydrology in the St. Louis Area

The site is located in one of the most intensely developed karst areas in the state. Naturally occurring overburden materials in this area are characterized by unconsolidated alluvial deposits overlying a thin residual of stoney clay. The stratigraphic sequence consists primarily of limestone and dolomite which were deposited, for the most part, in shallow epicontinental seas. The Precambrian rocks, the Lamotte Sandstone, and the lower part of the Bonneterre Formation are the only units that do not crop out in the area; they are, however, present in the subsurface.

The uppermost bedrock unit in the area belongs to the Post-Maquoketa Group. The Maquoketa Shale probably acts as a confining bed in the study area. The Pennsylvanian rocks of the Post-Maquoketa Group at the upper boundary of the group are relatively impermeable and yield very little water to wells. The bedrock aquifers in the general vicinity of the site, including Post-Maquoketa Group, Kimmswick-Joachim, St. Peter-Everton, Eminence-Lamotte, receive recharge from precipitation falling directly on the area. Movement of water from the soil and subsoil into the bedrock takes place along fractures and solution openings in the rock. Shallow bedrock aquifers that are hydraulically connected with the rivers also receive recharge from natural infiltration of the rivers during sustained high river stage and flooding.

Site-Specific Geological Information

The geology of the Deer Valley site consists of 10 to 15 feet of surficial material overlying karst limestone. Bedrock was "touched" in boring PBD-C-2-B at 15.5 feet and in boring Pond-2 at 12 feet during the 1989 SI (Figure 3), both of which are located on the slopes of the sinkhole and may not be representative of site conditions. Sampling during the SI was not carried to sufficient depth to map the bedrock surface or determine the presence of a residual soil layer. Bedrock is composed of St. Louis or Salem limestone. Department of Agriculture Soil Survey maps depict the Deer Valley site surface soils as Menfro silt loam. Menfro silt loam is noted for its good drainage and thick substratum, approximately 60 inches. However, it is likely that much of the upper soil section has probably been removed and relocated during construction and drum disposal.

The surficial material can be divided into two similar units, an upper silt-rich loess, and a lower clay-rich loess. The upper unit is approximately six to eight feet thick and includes, in part, the Menfro silt loam. This upper unit probably correlates with the Peoria loess. The Peoria is classified "ML (UNIFIED) 1," and is distinguished by a high silt content and high permeabilities, ranging from 10×10^{-4} to 46×10^{-4} cm/sec. The lower section, approximately four to six feet thick, has a higher clay content and is likely correlated with the Roxana loess, classified "ML-CL (UNIFIED) 1." The Roxana has a lower permeability, in the range of 0.03×10^{-4} to 1.0×10^{-4} cm/sec. It appears that drums have been buried down to and including the lower soil unit.

The Deer Valley site apparently has not been developed; however, much of the topography of the southern half of the property is not natural. In most of the area of concern, there is relatively little slope, as compared to the normal for that part of St. Louis County. St. Louis County is generally characterized by low hills and ridges separated by shallow valleys, typical of an advanced karst environment. Further evidence that soils on the property have been disturbed are areas of relief where sharp erosional gullies have been cut and covered only in very light vegetation.

No drinking water wells or beneficial uses of groundwater were identified within a four-mile radius of the site. Barium and lead were detected in the sample collected from the well on the neighboring Whiting property during the 1988 RI. Organics including carbon disulfide, 1,1-dichloroethane, and vinyl chloride at 12 µg/L, 5.5 µg/L, and 5.1 µg/L, respectively, were also detected in the well sample collected during the 1988 RI.

SURFACE WATER

Surface water drainage on the site primarily flows toward a small creek or gully which crosses the site, roughly from east to west in about the middle of the site. Water from the creek, as well as other small gullies, drains into a small depression, formerly a pond which is dry most of the time, located in the central-western area of the site (Figure 2), that has most likely resulted from sinkhole activity. From the former pond, surface run-off drains via Coldwater Creek or through the subsurface to the Missouri River (Figure 5). The site is approximately 0.8 of a mile from the Probable Point of Entry (PPE) on Coldwater Creek. Coldwater Creek flows approximately 1.8 miles from the PPE and joins the Missouri River which is to the northeast of the site. The Missouri River flows approximately 9.4 miles downstream of the site to its confluence with the Mississippi River.

The in-water segment of the surface water migration pathway includes Coldwater Creek, the Missouri River, and the Mississippi River. According to MDNR, the only surface water intakes are 11 miles upstream on the Missouri River and greater than 15 miles downstream on the Mississippi River; therefore, the site is not expected to impact drinking water supplies.

Coldwater Creek does not have a designated fishery, but was identified as a stream used for random fishing. A Heritage Database Report indicates sensitive environments that include federally designated endangered species, or communities are known to be present on the immediate site or surrounding area. Overwintering bald eagles may be found near the site area, as they are common winter residents in big river habitats where they feed on fish. Pallid sturgeons are big river fish that may range widely in the Mississippi River and Missouri River system.

SOIL

Soils at the Deer Valley site may have been impacted by previously observed ruptured drums. There are no residents, schools, or day-care centers located within 200 feet of the site. Currently, the site is not active. No workers are present on-site; however, six employees work at the Whiting Roll-up Doors facility. No sensitive environments are known to exist on-site. Approximately 4,476 people reside within one mile of the site.

AIR

A release of site contaminants into the air is not suspected because there is no evidence (i.e., analytical data, report of adverse health effects in areas surrounding the site, report of foul odors) of a release. A release to air would not be expected since the wastes on-site are suspected to have been buried. There is a population of approximately 92,269 within four miles of the site. Several residences are located within one-quarter mile from the site. No sensitive environments are known to exist within the target distance limit.

CONCLUSIONS

No drinking water wells or beneficial uses of groundwater were identified within a four-mile radius of the site. Barium and lead were detected in the sample collected from the well on the neighboring Whiting property during the 1988 RI. Organics including carbon disulfide, 1,1-dichloroethane, and vinyl chloride at 12 µg/L, 5.5 µg/L, and 5.1 µg/L, respectively, were also detected in the well sample collected during the 1988 RI. The area geology indicates the presence of advanced karst features beneath the site.

The site is approximately 0.8 of a mile from the surface water PPE. According to MDNR, the only surface water intakes are 11 miles upstream on the Missouri River and greater than 15 miles downstream on the Mississippi River; therefore, the site is not expected to impact drinking water supplies. Fisheries are present within the 15-mile downstream target distance limit. No samples have been collected from the in-water segments of the surface water migration pathway.

In the event that further work is contemplated at the Deer Valley site, the following actions should be included for consideration:

- Sampling of the shallow groundwater beneath the site may provide representative groundwater data. Dye tracing studies may provide data to determine whether a groundwater to surface water migration pathway exists.

- Sampling of surface water and sediment at or below PPE may provide information regarding release to the surface water migration pathway.

- A complete geophysical survey, excavation of trenches to determine the number of drums, and collection of additional environmental samples from the site and neighboring properties would provide information to better characterize the extent of contamination. A removal action may be considered if the data from the above investigation indicate the presence of significant amount of waste on-site.

If you have any questions regarding this report, please contact either of the undersigned at (913) 492-9218 for further clarification and/or discussion.

Sincerely,

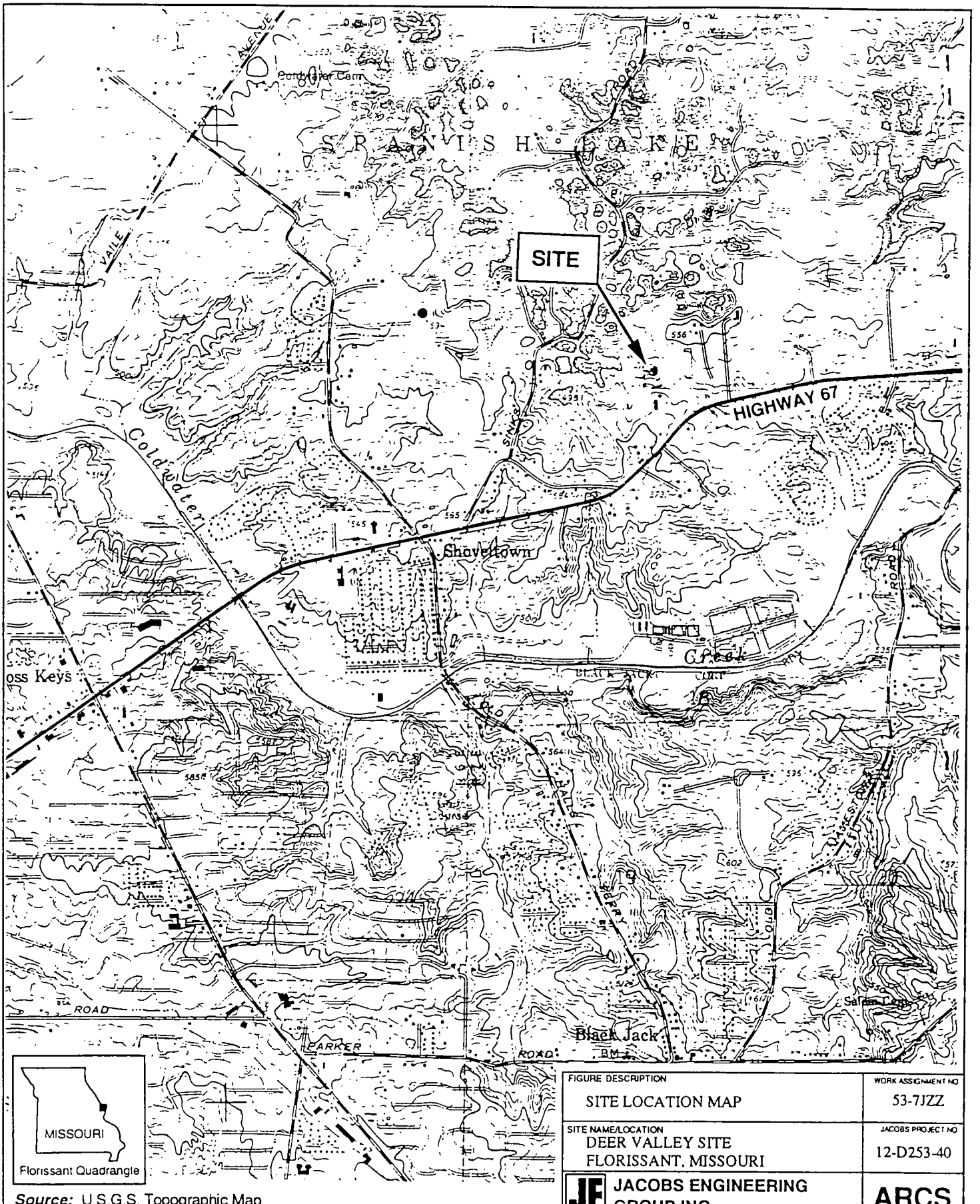
Leslie Scally

Leslie Scally
ARCS Project Manager

Fred D. Reynolds, P.E.
ARCS Program Manager

Attachments: Figures
Tables
Final SIP Report

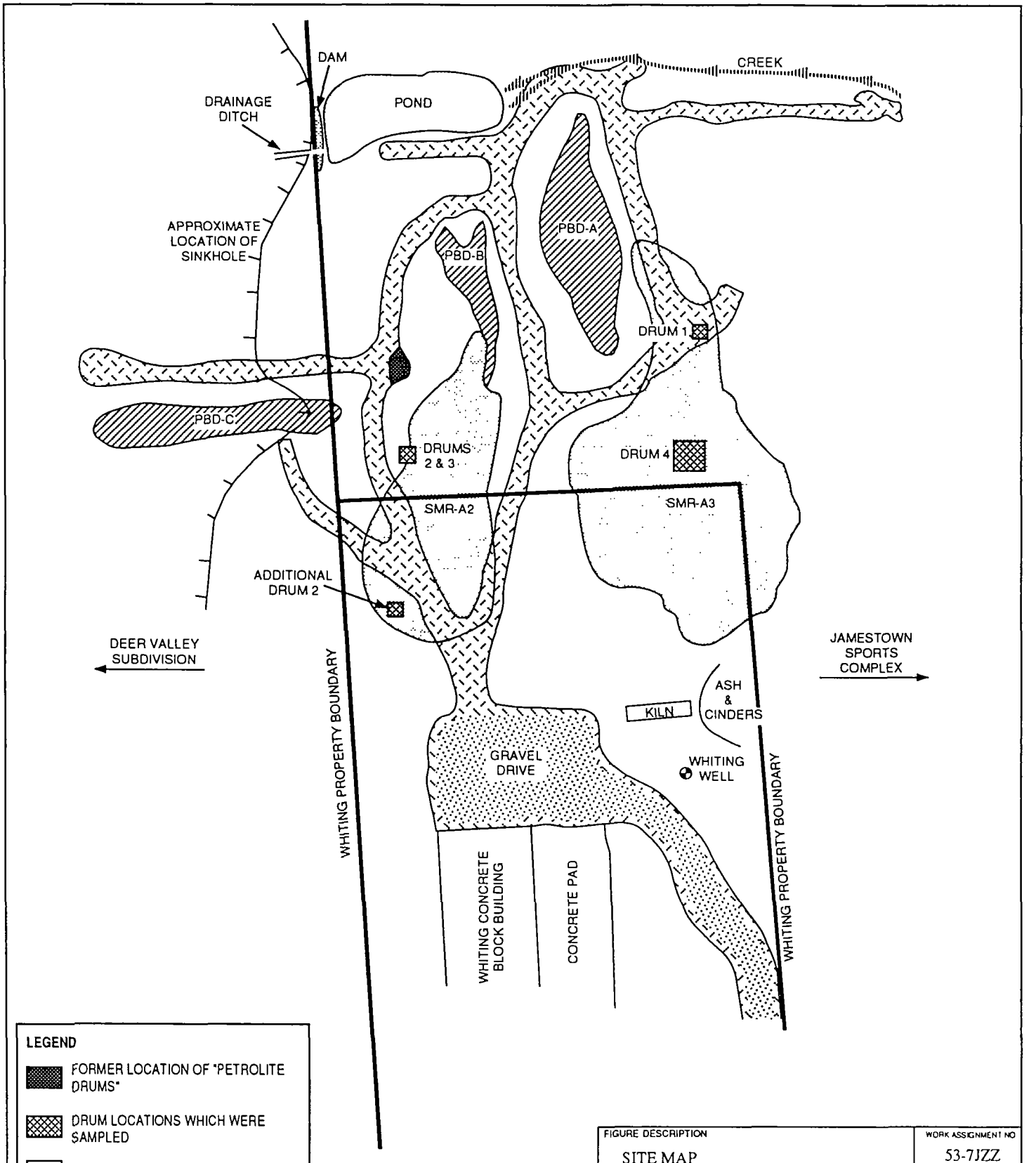
FIGURES



Source: U.S.G.S. Topographic Map

FIGURE DESCRIPTION: SITE LOCATION MAP	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 01/07/94	FIGURE NO: 1
CHECKED BY: TS DATE: 01/07/94	

D253-40-001



LEGEND

- FORMER LOCATION OF "PETROLITE DRUMS"
- DRUM LOCATIONS WHICH WERE SAMPLED
- ROADS CREATED FOR RI
- PARTIALLY BURIED DRUMS (PBD)
- SUBSURFACE METAL READINGS (SMR)

N

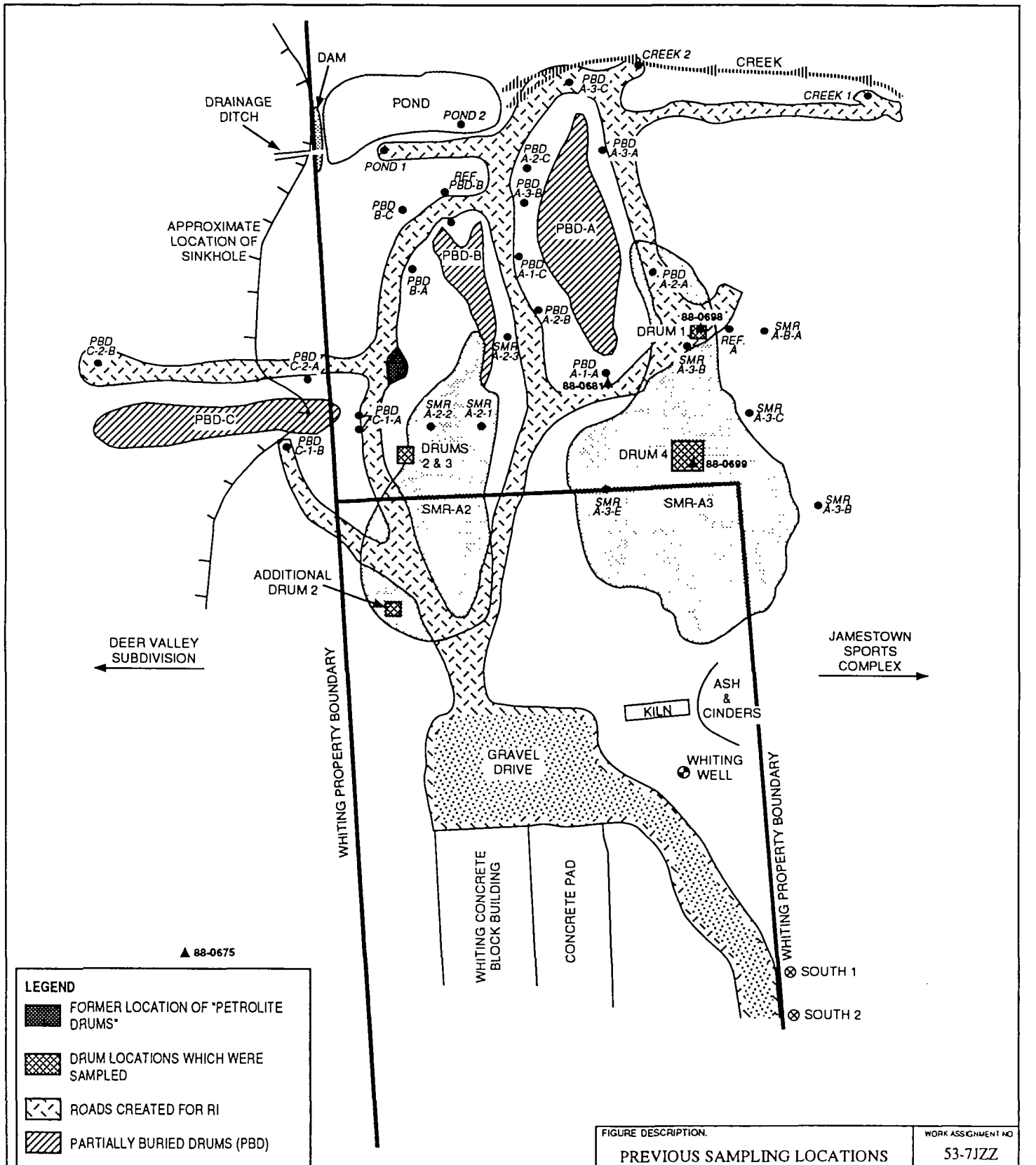
0 320

Approximate Scale in Feet

Source: Metcalf & Associates RI Report, 1989

FIGURE DESCRIPTION: SITE MAP	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 06/10/94	FIGURE NO: 2
CHECKED BY: TS DATE: 06/10/94	

D253-40-002



Source: Metcalf & Associates RI Report, 1989

FIGURE DESCRIPTION: PREVIOUS SAMPLING LOCATIONS	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 06/10/94	FIGURE NO: 3
CHECKED BY: TS DATE: 06/10/94	

D253-40-002

FIGURE DESCRIPTION: FOUR-MILE RADIUS MAP	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 01/07/94	FIGURE NO: 4
CHECKED BY: TS DATE: 01/07/94	

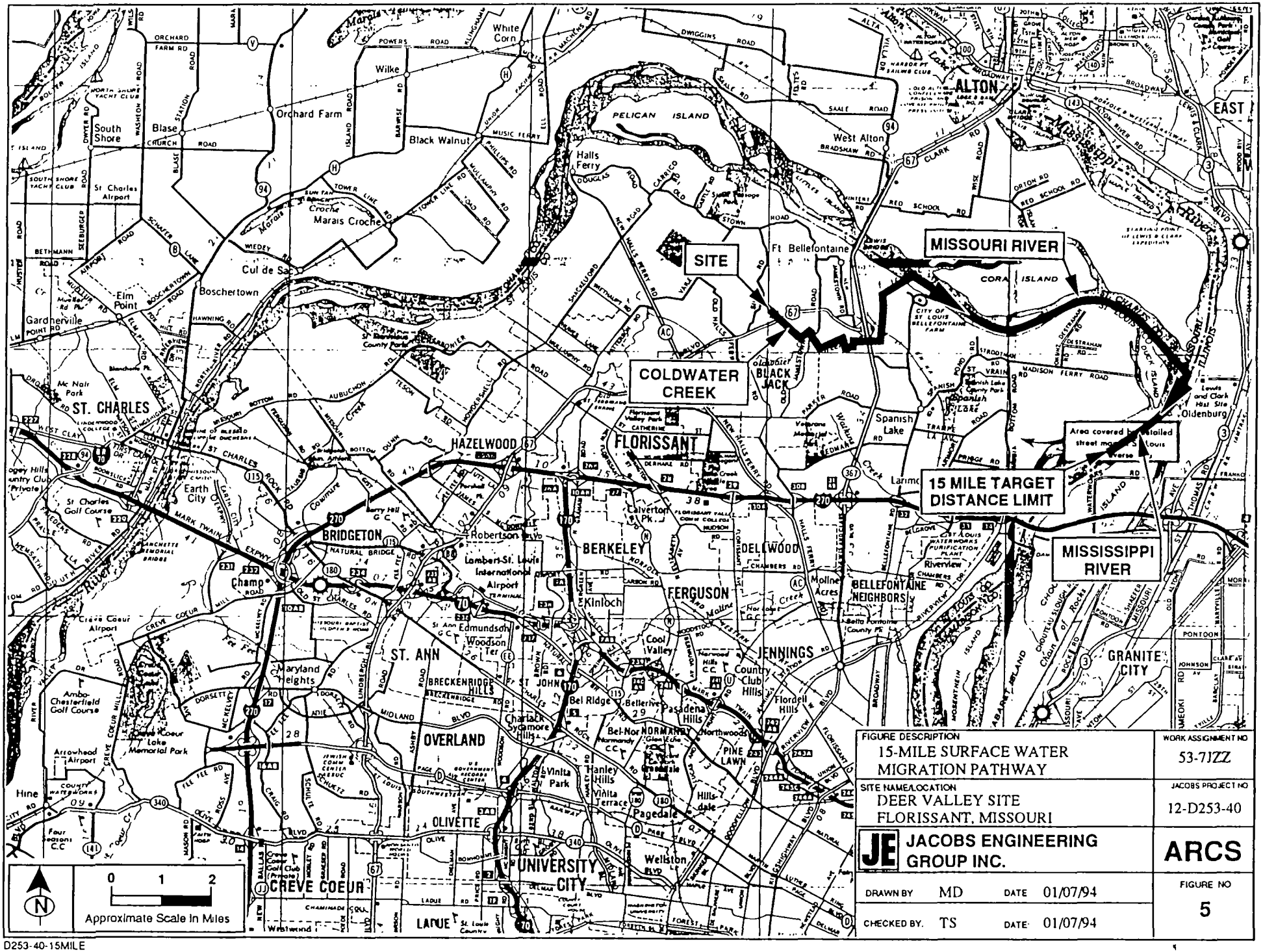


FIGURE DESCRIPTION: 15-MILE SURFACE WATER MIGRATION PATHWAY	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 01/07/94	FIGURE NO: 5
CHECKED BY: TS DATE: 01/07/94	

D253-40-15MILE

TABLES

TABLE 1
MAXIMUM DETECTED CONCENTRATIONS IN SOIL (mg/kg)
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011
SEPTEMBER 1988

MDNR/PRP Sample Number	PRP Sample Location	Depth (In feet bgs)	CONTAMINANTS						
			Acetone	Cadmium	Chlordane	Chloroform	Ethylbenzene	Lead	Mercury
88-0698	Drum No. 1	NA	0.35	ND	ND	ND	ND	ND	ND
88-0699	Drum No. 1	NA	ND	ND	ND	ND	2.50	ND	ND
PBD-C-1-U	Composite Soil	0 to 6	ND	4.30	ND	ND	ND	231.00	2.60
PBD-C-2-U	Composite Soil	0 to 6	ND	ND	1.00	ND	ND	ND	ND
PBD-G1-B	Composite Soil	6 to 12	ND	ND	ND	29.00	ND	ND	ND
88-0681	Composite Soil	6 to 12	ND	ND	ND	ND	ND	ND	ND
88-0675	Background Level	6 to 12	ND	ND	ND	ND	ND	ND	ND
Health-Based Bench Marks	EPA Reference Dose Screening Concentration	NA	5.8E+04	2.90E+02	3.50E+01	5.80E+03	5.80E+04	NL	1.70E+02
	EPA Cancer Risk Screening Concentration	NA	NL	NL	4.50E-01	9.60E+01	NL	NL	NL
	EPA Proposed RCRA Soil Action Level	NA	8.00E+03	4.00E+01	5.0E-01	1.00E+02	8.00E+03	NL	2.00E+01
	EPA Carcinogenicity Classification	NA	D	B1	B2	B2	D	B2	D

Note: All concentrations reported in ppb unless noted in table. Locations are shown in Figure 3.

- Shaded data exceed at least one of the listed Regulatory Levels.
NL - Not listed
ND - Nont Detected
A - Human carcinogen
B - Probable human carcinogen
B1 - Limited evidence of carcinogenicity
B2 - Sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans
C - Possible human carcinogen (limited evidence of carcinogenicity in animals or lack of human data)
D - Not classifiable as to human carcinogenicity

TABLE 1 (Continued)
MAXIMUM DETECTED CONCENTRATIONS IN SOIL (mg/kg)
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011
SEPTEMBER 1988

MDNR/PRP Sample Number	PRP Sample Location	Depth (in feet bgs)	CONTAMINANTS				
			Methylene-Chloride	Styrene	Toluene	Trichloroethylene	Vinyl-Chloride
88-0698	Drum No. 1	NA	ND	2.00	ND	ND	ND
88-0699	Drum No. 1	NA	ND	ND	ND	6,900	ND
PBD-C-1-U	Composite Soil	0 to 6	ND	ND	ND	ND	ND
PBD-C-2-U	Composite Soil	0 to 6	ND	ND	ND	ND	ND
PBD-G1-B	Composite Soil	6 to 12	ND	ND	ND	ND	ND
88-0681	Composite Soil	6 to 12	ND	ND	0.39	ND	ND
88-0675	Background Level	6 to 12	1,000	ND	ND	ND	ND
Health-Based Bench Marks	EPA Reference Dose Screening Concentration	NA	3.50E+0.0	1.25E+0.0	1.25E+0.0	NL	NL
	EPA Cancer Risk Screening Concentration	NA	7.80E-0.3	NL	NL	5.30E+01	3.10E-01
	EPA Proposed RCRA Soil Action Level	NA	9.00E+01	2.00E+02	2.00E+02	6.00E+01	NL
	EPA Carcinogenicity Classification	NA	B	C	C	B2	A

TABLE 2
MAXIMUM DETECTED CONCENTRATIONS IN GROUNDWATER (mg/L)
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011
SEPTEMBER 1988

		CONTAMINANTS			
EPA Sample Number	**EPA Sample Location**	**Barium**	**Carbon Disulfide**	**1,1-Dichloroethane**	**Vinyl Chloride**
10/27 C	Deer Valley Well 10/27	1.87	ND	ND	ND
88-1758	Whiting Well	ND	0.12	0.0055	0.0051
Health-Based Bench Marks	MCL	2.0E+3.0	NL	NL	2
	MCLG	2.0E+3.0	NL	NL	0
	SMCL	NL	NL	NL	NL
	EPA Reference Dose Screening Concentration	2.50E+00	2.50E+00	3.50E+01	5.80E+03
	EPA Cancer Risk Screening Concentration	NL	NL	NL	18E+0.5
	EPA Carcinogenicity Classification	D	D	NL	A

Note: All concentrations reported in ppb unless noted in table. Locations are shown in Figure 3.

NL - Not listed
ND - Not Detected
A - Human carcinogen
B - Probable human carcinogen
B1 - Limited evidence of carcinogenicity
B2 - Sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans
C - Possible human carcinogen (limited evidence of carcinogenicity in animals or lack of human data)
D - Not classifiable as to human carcinogenicity

U.S. ENVIRONMENTAL PROTECTION AGENCY

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY

REGIONS VI, VII, VIII

FINAL
SITE INSPECTION PRIORITIZATION REPORT
FOR THE
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011

EPA CONTRACT NO. 68-W8-0122
EPA WORK ASSIGNMENT NO. 53-7JZZ
EPA REGION VII

JACOBS ENGINEERING GROUP INC.
8208 MELROSE DRIVE, SUITE 210
LENEXA, KANSAS 66214
(913) 492-9218
PROJECT NO. 12-D253-40

APRIL 1995

TABLE OF CONTENTS

SECTION			PAGE
1.0	INTRODUCTION		1
2.0	SITE BACKGROUND		1
3.0	HAZARD RANKING SYSTEM SCORING		5
	3.1	Source(s)/Waste Characteristics	5
	3.2	Groundwater Pathway	5
	3.3	Surface Water Pathway	7
	3.4	Soil Exposure Pathway	7
	3.5	Air Pathway	7
4.0	DATA GAPS		8
5.0	CONCLUSIONS		8

LIST OF FIGURES

Figure 1 Site Location Map
Figure 2 Site Map
Figure 3 Previous Sampling Locations
Figure 4 Four-Mile Radius Map
Figure 5 15-Mile Surface Water Migration Pathway

LIST OF TABLES

Table 1 Maximum Detected Concentrations in Soil (mg/kg)
Table 2 Maximum Detected Concentrations in Groundwater (mg/L)

LIST OF APPENDICES

Appendix A PA Scoresheets
Appendix B Reference Cover Sheets

FINAL
SITE INSPECTION PRIORITIZATION REPORT
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011

1.0 INTRODUCTION

Jacobs Engineering Group Inc. (Jacobs) was tasked by the U.S. Environmental Protection Agency (EPA) to evaluate the Deer Valley site (site) (CERCLIS No. MOD981712011) (Figure 1), Florissant, Missouri as a potential candidate for an Expanded Site Inspection (ESI) under the Site Inspection Prioritization (SIP) guidelines. The evaluation included a review of EPA and state file material and a review of potential contaminant receptor information.

The PA Scoresheet methodology was utilized to evaluate the site, resulting in a site score of 3. A source comprising 500 drums, partially filled with various chemicals (approximately 25,000 gallons) is suspected to be buried on-site. Additionally, the total area of the site, approximately 25 acres of probable contaminated soil, was used for the evaluation purposes (Reference 1). The waste characteristics value generated by the site source was 18 (Appendix A, page 4). The individual pathway scores were as follows: groundwater, 1; surface water, 1; soil exposure, 2; and air, 6 (Appendix A, page 24). It was determined after evaluating the site with the PA Scoresheet methodology that the site score would not be greater than 28.5 and that additional Hazard Ranking System (HRS) scoring (i.e., Site Investigation [SI] Worksheets, HRS PREscore) would not result in a score greater than 28.5.

2.0 SITE BACKGROUND

The site is located near Florissant, St. Louis County, Missouri (Figure 1). The site can be reached by taking Highway 67 north (Lindbergh Boulevard) from I-270, approximately six miles to Jamestown Sports Complex. After turning left at the Sports Complex and left again at Whiting Roll-up Doors, the site is located north of the Whiting Roll-up Doors' property. The geographical co-ordinates of the site are 38°49'20" North latitude and 90°16'04" West longitude. The legal description of the site is as follows: northwest quarter of the northwest quarter of the northeast quarter of Section 18 and southwest quarter of the southwest quarter of the southeast quarter of Section 7, Township 47 north, Range 7 east (Reference 1).

The site is approximately 25 acres on the east side of the Deer Valley housing subdivision, north of Whiting Roll-up Doors (a truck door manufacturer) at 5015 North Highway 67, and west of the Jamestown Sports Complex (an indoor soccer facility) (Figure 2). The site was discovered in December 1986 through a complaint to state authorities from a potential property buyer (Reference 1).

A Preliminary Assessment (PA) was conducted on the site on December 19, 1986 by Missouri Department of Natural Resources (MDNR). The purpose of the investigation was to collect information concerning conditions at the site sufficient to assess the potential for adverse effects to human health and the environment resulting from contaminants associated with the site and to determine the possible need for additional action. Preliminary investigations regarding the location of the site conducted by MDNR during the December 1986 PA revealed that the site was not located in the property boundaries of Deer Valley housing board, but was included in the adjacent property owned by Teamsters' Local No. 682, Health and Welfare Trust Fund. Observations made by MDNR during the investigation indicated the presence of approximately 50 exposed drums. The exposed drums were identified by MDNR as follows:

Petrolite Corporation	22 Drums
Schenectady Chemicals, Inc.	1 Drum
Dow Chemical	1 Drum
Unmarked	26 Drums

Additional observations by MDNR during the December 1986 investigation indicated an old brick kiln structure (lined inside with concrete), about 100 feet east-northeast of the Whiting building (Figure 2), possibly used by previous occupants to incinerate residues in the drum reconditioning business. Ashes and cinders were observed by MDNR adjacent to the kiln on the south and east sides, along with a few drum heads (Reference 1).

On January 8, 1987, a second site visit was conducted by MDNR. Representatives from the Petrolite Corporation were also present to inspect the "Petrolite" drums. After examining the drums and researching company files, the Director of Health, Safety, and Environmental Affairs at Petrolite stated that the drums had contained phenolic formaldehyde resins in aromatic hydrocarbons, used as de-emulsifiers in oil production. Evidently, some of the product was returned to Petrolite at some time in the 1960s by a customer due to polymerization which prevented its use. After Petrolite recovered any free liquids, the drums were discarded by Petrolite. The Petrolite representative was unable to determine how the drums were discarded, but sale to a drum reconditioner was considered by Petrolite as a likely answer (Reference 1).

Based on the observations made by MDNR during the December 1986 and January 1987 investigations, MDNR recommended that drum contents, spill residues, and nearby soils be sampled, that a metal detection survey be conducted to determine the extent of drum burial, and that excavation of buried drums be performed to determine whether buried hazardous wastes are present (Reference 1).

On January 21, 1987, a limited site sampling was conducted by MDNR. Composite soil samples and samples of spill residues and "Petrolite" drum contents were collected during the January 1987 investigation. Most of the remaining drums on-site appeared to be empty; however, some of the drums were partially full, but the contents of the drums were frozen and could not be sampled by MDNR. The depths of composite soil samples are not known. Samples collected during the January 1987 investigation were analyzed for volatile organic compounds (VOC), Toxicity Extraction Procedure (TEP) metals, and flashpoint. Analytical results did not indicate the presence of any contaminants in the soil samples; however, one composite drum sample was determined by MDNR to be hazardous based on ignitability (flashpoint of 54°C) (Reference 1).

On January 23, 1987, the Director of Petrolite requested permission from MDNR to remove drums from the site bearing the Petrolite labels. On February 24, 1987, MDNR approved that request, and on March 10, 1987, Petrolite removed a total of 22 drums from the site. The drums were removed from the site by Petrolite Corporation and temporarily stored at another Petrolite facility in Webster Groves, Missouri prior to off-site disposal as a hazardous waste (Reference 1).

On March 3, 1987, a metal detection survey of the property was conducted by MDNR to determine the presence of any buried drums on-site. The survey indicated the presence of buried metal in three areas of the site, although it was difficult to determine whether these were three distinct areas or portions of one area (Figure 3). A sinkhole was also documented to be present at the site between the potential drum disposal area "PBD-C" and an on-site pond; however, no other information is available on the sinkhole. Based on the metal detection readings, variations in the topography and vegetation on the site, as well as the presence of partially exposed drums, MDNR suspected that the site could contain a large number of buried drums (Reference 1).

MDNR suspected that one area of buried metal (potentially drums) extends onto the Whiting property, and that another such area existed on the property to the west of the Whiting property (Figure 3) based on the investigations conducted by MDNR during 1986 and 1987. According to MDNR, one area of partially buried drums lies along a ravine trending east to west, the majority of which lies on the property to the west of the site (Reference 1).

A summary of ownership history for the Deer Valley site property follows:

(1950s) - 1963
Mr. Frank E. Westerhold
F.E. Westerhold Cooperage Company
(address and current status of Mr. Westerhold unknown)

1963 - 1969
Mr. Robert G. Evans
Evans Steel Barrel, Inc.
P.O. Box 95
Harvey, Louisiana 70058

1969 - 1973
Mr. Lauren Whiting
Whiting Roll-Up Door Manufacturing Corp.
113 Cedar Street
Akron, New York 14001

1973 - present
Teamsters' Local No. 682, Health and Welfare Trust Fund
c/o Wiley, Craig, Armbruster & Wilburn
Suite 650, Shell Building
1221 Locust Street
St. Louis, Missouri 63103

On April 3, 1987, MDNR contacted Mr. Robert Evans, of Evans Steel Barrel, Inc., for information regarding his company's operations at the Deer Valley site. Mr. Evans informed MDNR that prior to 1963 the property was occupied by the F.E. Westerhold Cooperage Company, a drum reconditioning company owned and operated by Mr. Frank E. Westerhold. In 1963, Evans Steel Barrel, Inc. purchased the company and operated it as Westerhold Containers, Inc. until 1969 (Reference 1). Westerhold Containers, Inc. purchased drums containing a wide range of product residues from many area businesses for reconditioning and resale. The company practice was to accept drums with only "limited quantities of material," although Mr. Evans admitted to MDNR that, due to the lack of hazardous waste regulations at that time, drums may have contained varying quantities of products. Mr. Evans informed MDNR that he could not recall the names of the companies from which drums were accepted (Reference 1).

Mr. Evans indicated to MDNR that the drum residues were hauled from the site for disposal, and unusable drums were sold to a scrap metal dealer. Mr. Evans could not recall the names of the firms which hauled residues from the site. Mr. Evans informed MDNR that he was not involved in the day-to-day operations of the facility and that there were several managers at the plant over the years it operated. Mr. Evans informed MDNR that he was unaware of any on-site waste disposal practice during the years Evans Steel Barrel Company owned the property. Mr. Evans also indicated to MDNR that he did not have any knowledge of waste management practices at the site prior to 1963. In 1969, the facility was sold to Whiting Roll-Up Doors (Reference 1).

In October 1987, the Teamsters' Local No. 682, current property owners since 1973 and a Potentially Responsible Party (PRP), hired Metcalf and Associates of St. Charles, Missouri to develop a Remedial Action Plan for the site. In December 1987, the PRP contractor, Metcalf and Associates, submitted a draft Remedial Investigation Plan to MDNR. MDNR recommended a few changes to the draft Remedial Action Plan after review. A revised plan incorporating MDNR's recommendations was submitted to MDNR by the PRP contractor on June 14, 1988. The revised plan was approved by MDNR on June 23, 1988 (Reference 1).

The PRP contractor conducted a Remedial Investigation (RI), with MDNR oversight, in September 1988. A total of 32 borings were drilled around the site, resulting in 28 soil samples during the RI. For each sampling point, aliquots were obtained from two, four, six, eight, 10, and 12 feet. An upper (two to six feet) and/or lower (eight to 12 feet) composite was made for each sampling point. In addition to the 32 borings, four exploratory excavations were made. Several buried drums were uncovered and sampled during the RI. A sample from a water well serving the Whiting Roll-Up Door Manufacturing Co. facility was also collected. Samples collected during the RI were analyzed for total metals, TEP metals, pesticides, VOCs, and semi-VOCs (Reference 2).

Chlordane, chloroform, and heavy metals were detected in soil samples (Table 1). MDNR determined that a significant amount of the scrap metal on-site consisted of tracks from roll-up doors similar to the ones manufactured in the Whiting Roll-up Door facility (Reference 16).

MDNR contacted Mr. Lauren Whiting, owner of the Whiting Roll-Up Doors on September 16, 1988 regarding potential hazardous materials on Whiting Door property. Mr. Whiting informed MDNR that the Deer Valley site was owned and occupied by a drum reconditioning company in the past. Mr. Whiting indicated to MDNR that he purchased the property in 1969 and in 1973 sold it to the Teamsters' Local. Mr. Whiting also informed MDNR that he continued operations at the property and in 1978 purchased back a part of the property, approximately three acres, currently occupied by Whiting Roll-Up Doors facility (Reference 1).

In August 1989, a SI was performed by MDNR. The purpose of the SI was to perform oversight and review of the RI conducted by the PRP contractor. The samples were collected by the PRP contractor, however, MDNR collected the splits. A total of 28 sample splits were collected by MDNR during the SI. Of these 28 splits, 16 samples were submitted by MDNR for laboratory analysis. These 16 sample splits consisted of one groundwater, two drum contents, and 13 composite soil samples (Reference 1).

The water sample (Sample No. 88-1758) was collected from the Whiting well located on the property immediately south of the property owned by the Teamsters' Union (Figure 2). The sample was collected by MDNR from a sink faucet located in the Whiting Roll-Up Door Company office. Sample No. 88-1758 was analyzed for VOCs and total silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium. Carbon disulfide, 1,1-dichloroethane, and vinyl chloride were detected in the Sample No. 88-1758 (Table 2) (Reference 16).

The drum contents sample splits (Sample Nos. 88-0698 and 88-0699) were collected by MDNR during the RI from drum No. 1 and drum No. 4 (Figure 3). MDNR intentionally unearthed these two drums and sampled them as part of the investigation process. Sample No. 88-0698 (drum No. 1) was analyzed for VOCs, flash point, total and TEP concentrations of silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium. Sample No. 88-0699 (drum No. 4) was analyzed for VOCs and pesticides. Acetone and styrene were detected in drum No. 1 at concentrations of 0.35 mg/kg and 2.0 mg/kg, respectively. Ethyl benzene was detected in drum No. 4 at a concentration of 2.5 mg/kg (Table 1) (Reference 16).

Thirteen composite soil sample splits were collected by MDNR from potential areas of waste deposition. The sample material for each composite was collected using a trailer-mounted drill rig to auger and push a split spoon sampler to retrieve the sample. Metals including cadmium, lead, and mercury and organics including chlordane, chloroform, methylene chloride, and toluene were detected in the composite soil samples. During the pesticide analyses of the soil samples, spikes typical to polychlorinated biphenyls (PCB) were identified. However, the samples were not specifically tested for PCBs. Based on this observation, PCBs are suspected to be present on-site (Reference 16).

The 1988 RI by the PRP contractor, with oversight by MDNR, recommended a complete removal of the buried wastes. The PRP did not act on this recommendation, but instead chose to conduct further investigation. Additional investigation was proposed by the PRP contractor, Metcalf and Associates Inc., in the 1992 RI Work Plan. The purpose and scope of the 1992 RI Work Plan was to continue the work begun previously at the Deer Valley site.

Further sampling and excavation were proposed by the PRP to determine the total amount of waste present and the environmental threat posed thereby (Reference 16).

The PRP requested MDNR oversight during the RI and cleanup activities. MDNR reviewed and commented on the Work Plan in February 1993 (Reference 16).

Activities outlined in the RI Work Plan included: sampling and analysis of an ash bank that had been used as fill material in a gully, the bottom of the gully where empty chemical bottles were previously observed, and standing water in the pond and the sediment in the bottom of the pond; installation of groundwater monitoring wells; and investigative excavation. Samples collected were to be analyzed for acidity, alkalinity, bicarbonate, carbonate chloride, chemical oxygen demand (COD), Toxicity Characteristic Leaching Procedure (TCLP) metals, nitrogen (ammonia, Kjeldahl nitrogen, total nitrate), oil and grease, sulfate, solids (total dissolved and total suspended), total organic carbon (TOC), and total organic halogen (TOH or TOX) (Reference 16).

According to attorneys representing Teamster's Local No. 682, Health and Welfare Trust Fund, additional investigative activities were completed by the PRP contractor in October 1994 (conversation with Olberding 3/23/94). Results of this investigation have not been forwarded to MDNR or EPA as of March 23, 1995. MDNR is waiting for the PRPs to continue their voluntary cleanup program (Reference 15).

3.0 HAZARD RANKING SYSTEM SCORING

The Deer Valley site score is 3, using the PA Scoresheet methodology (Appendix A, page 24). The groundwater and soil pathways are evaluated with suspected release criteria. A release to surface water is not expected due to the high infiltration rates, the discharge of overland flow into a sinkhole complex, and the fact that any potential contaminants are buried. The following values were reported for each of the pathways: groundwater, 1; surface water, 1; soil exposure, 2; and air, 6 (Appendix A, page 24).

3.1 Source(s)/Waste Characteristics

The potential sources of contamination at the site are buried drums (approximately 500, 55-gallon drums) containing an estimated 25,000 gallons and an area of contaminated soil approximately 25 acres in size (Reference 1). The sources were determined based on the history of the site (a drum reconditioning business in operation for at least 20 years), aerial photographs (showing several thousand drums and large areas of disturbed earth), and analytical results of the samples collected by the PRP contractor during the September 1988 RI. A source Hazardous Waste Quantity (HWQ) value of 50 for the drums and a HWQ value of 32.4 for the 25 acres of contaminated soil were obtained. A total HWQ of 82.4 was obtained from the two potential sources. The PA Scoresheet methodology resulted in a waste characteristics score of 18 for the site.

The suspected wastes include various metals such as barium, lead, and silver, VOCs including chloroform, methylene chloride, 1,1-dichloroethane, acetone, carbon disulfide, vinyl chloride, styrene and ethylbenzene. PCBs are also suspected to be present on-site, but this was not confirmed since none of the samples were analyzed for PCBs.

3.2 Groundwater Pathway

3.2.1 Geology and Hydrology in the St. Louis Area

The site is located in one of the most intensely developed karst areas in the state. Naturally occurring overburden materials in this area are characterized by unconsolidated alluvial deposits overlying a thin residual of stoney clay. The stratigraphic sequence consists primarily of limestone and dolomite which were deposited mainly in shallow epicontinental seas. The Precambrian rocks, the Lamotte Sandstone, and the lower part of the Bonneterre Formation are the only units that do not crop out in the area; they are, however, present in the subsurface (Reference 12).

The uppermost bedrock unit in the area belongs to the Post-Maquoketa Group. The Maquoketa Shale probably acts as a confining bed in the study area. The Pennsylvanian rocks of the Post-Maquoketa Group at the upper boundary of the group are relatively impermeable and yield very little water to wells. The bedrock aquifers in the general vicinity of the site, including Post-Maquoketa Group, Kimmswick-Joachim, St. Peter-Everton, Eminence-Lamotte, receive recharge from precipitation falling directly on the area. Movement of water from the soil and subsoil into the bedrock takes place along fractures and solution openings in the rock. Shallow bedrock aquifers that are hydraulically connected with the rivers also receive recharge from natural infiltration of the rivers during sustained high river stage and flooding (Reference 12).

3.2.2 Site-Specific Geological Information

The geology of the Deer Valley site consists of 10 to 15 feet of surficial material overlying karst limestone. Bedrock was "touched" in boring PBD-C-2-B at 15.5 feet and in boring Pond-2 at 12 feet during the 1989 SI (Figure 3), both of which are located on the slopes of the sinkhole and may not be representative of site conditions. Sampling during the SI was not carried to sufficient depth to map the bedrock surface or determine the presence of a residual soil layer. Bedrock is composed of St. Louis or Salem limestone. Department of Agriculture Soil Survey maps depict the Deer Valley site surface soils as Menfro silt loam. Menfro silt loam is noted for its good drainage and thick substratum, approximately 60 inches. However, it is likely that much of the upper soil section has probably been removed and relocated during construction and drum disposal (Reference 1).

The surficial material can be divided into two similar units, an upper silt-rich loess, and a lower clay-rich loess. The upper unit is approximately six to eight feet thick and includes, in part, the Menfro silt loam. The upper unit probably correlates with the Peoria loess. The Peoria is classified "ML (UNIFIED) 1," and is distinguished by a high silt content and high permeabilities, ranging from 10×10^{-4} - 46×10^{-4} cm/sec (Reference 1). The lower section, approximately four to six feet thick, has a higher clay content and is likely correlated with the Roxana loess, classified "ML-CL (UNIFIED) 1." The Roxana has a lower permeability, in the range of 0.03×10^{-4} - 1.0×10^{-4} cm/sec. It appears that buried drums are in contact with the lower unit (Reference 1).

The Deer Valley site apparently has not been developed; however, much of the topography of the southern half of the property is not natural. In most of the area of concern, there is relatively little slope, as compared to the normal for that part of St. Louis County. St. Louis County is generally characterized by low hills and ridges separated by shallow valleys, typical of an advanced karst environment. Further evidence that soils on the property have been disturbed are areas of relief where sharp erosional gullies have been cut and covered only in very light vegetation (Reference 1).

3.2.3 Groundwater Migration Pathway HRS Scoring

The groundwater pathway was scored with a suspected release due to detected levels of vinyl chloride, 1,1-dichloroethane, and carbon disulfide contamination in groundwater (Table 1) (Reference 13) and the presence of ruptured drums buried at the site (Reference 2). The Whiting well was sampled during the RI; however, the Whiting well is not used for drinking water. The Whiting well is approximately 200 feet deep. Barium and lead were detected in the Whiting well sample collected by MDNR during the 1988 RI at a concentration of 41 mg/L and 100 mg/L, respectively. Organics including carbon disulfide, 1,1-dichloroethane, and vinyl chloride were detected at 12 µg/L, 5.5 µg/L and 5.1 µg/L, respectively. No drinking water wells or other uses of groundwater were identified within a four-mile radius of the site (Figure 4) (Reference 4). Primary and secondary targets received a value of 0. No wellhead protection areas exist within four miles of the site (Reference 3). The groundwater pathway score for the site is 1.

3.3 Surface Water Pathway

Surface water drainage on the site primarily flows toward a small creek or gully which crosses the site, roughly from east to west in about the middle of the site. Water from the creek, as well as other small gullies, drains into a small depression, formerly a pond which is dry most of the time, located in the central-western area of the site (Figure 2), that has most likely resulted from sinkhole activity. From the former pond, surface run-off drains via Coldwater Creek or through the subsurface to the Missouri River (Figure 5) (Reference 1). The site is approximately 0.8 of a mile from the Probable Point of Entry (PPE) on Coldwater Creek. Coldwater Creek flows approximately 1.8 miles from the PPE and joins the Missouri River which is to the northeast of the site. The Missouri River flows approximately 9.4 miles downstream of the site to its confluence with the Mississippi River.

The in-water segment of the surface water migration pathway includes Coldwater Creek, the Missouri River, and the Mississippi River. A release to the surface water pathway was not suspected. The infiltration rate is high, the nearest stream is 0.8 of a mile across karst landscape, and the remaining waste is buried (Reference 1). No information is available to document a groundwater to surface water migration pathway.

The drinking water threat was not evaluated. According to MDNR, the only surface water intakes are 11 miles upstream on the Missouri River and greater than 15 miles downstream on the Mississippi River (Reference 4); therefore, the site is not expected to impact drinking water supplies.

Human food chain and environmental threat targets were evaluated. Primary fisheries within the surface water migration pathway were not identified. Coldwater Creek does not have a designated fishery, but was identified as a stream used for random fishing. Since the Coldwater Creek has a flow between 10 and 100 cubic feet per second (cfs) and is identified as a secondary fishery, the human food chain threat targets received a score of 30 (Appendix A, page 13).

Sensitive environments that are known to be present on the immediate site or surrounding area include federally designated endangered species. Overwintering bald eagles may be found near the site area, as they are common winter residents in big river habitats and major lakes where they feed on fish. Pallid sturgeons may range widely in the Mississippi and Missouri River system (Reference 7). The presence of secondary sensitive environments were evaluated but received a score of 0 since the targets were identified in the Mississippi and Missouri Rivers which have flow rates greater than 10,000 cfs (Reference 7).

3.4 Soil Exposure Pathway

The soil exposure pathway was evaluated with suspected release criterion since ruptured drums containing waste have been observed on-site. Contamination was detected in soil samples collected from the site during the 1988 RI (Reference 13). Analytical results of the soil samples collected during the RI are summarized in Table 1. The likelihood of exposure (LE) received a value of 550 for suspected release. The distance to the nearest residence, school, and/or day-care is greater than the target distance limit; therefore, they received values of 0. The total value for the resident population threat targets was 5, which was due to the six employees working on-site at the Whiting Roll-Up Doors facility (Reference 10). The soil exposure pathway score was 2 (Appendix A, page 23).

3.5 Air Pathway

Targets identified for the air pathway included the population within four miles of the site (evaluated as secondary targets), the nearest individual, and resources (Appendix A). Two methods were utilized to evaluate populations within four miles of the site. A house count was performed using U.S. Geological Survey Topographic maps (Reference 11). The number of houses within one-half of a mile from the site was multiplied by the "county multiplier" for St. Louis County (2.57 individuals per household) (Reference 14) to determine the approximate number of persons. The EPA Graphical Exposure Modeling System (GEMS) (Reference 8) was used to determine

populations in distance categories greater than one-half of a mile from the center of the site.

A release to air was not suspected since site contaminants are buried. The secondary target population was assigned a value of 51. Several residences are within one-quarter of a mile from the site (References 8 and 11), so the nearest individual threat target received a value of 20. No sensitive environments were identified within one-half of a mile from the site, so the sensitive environment target received a value of 0. The resource target was assigned a default value of 5 for the resource target. The total air pathway threat target score was 57. The total air pathway score was 6 (Appendix A, page 22).

4.0 DATA GAPS

The following data gaps were noted for the Deer Valley site during the SIP process. Recent site data, such as wildlife on-site and current housing increase (there were several houses going up around the site according to earlier reports), are not currently known. This data may be useful in identifying additional targets.

5.0 CONCLUSIONS

It is anticipated that additional site assessment activities at the site (i.e., ESI) would not generate any data which would contribute to a HRS score of 28.5 or greater. Sampling the shallow groundwater at the disposal site and Coldwater Creek at the PPE may lead to an increase in the groundwater and surface water pathway scores, respectively, but may not increase the site score above 28.5 due to limited targets. The drums that were partially exposed have been removed by Petrolite Chemicals and/or MDNR. In the event that further work is contemplated at the Deer Valley site, the following actions should be included for consideration:

- Sampling of the shallow groundwater beneath the site may provide representative groundwater data. Dye tracing studies may provide data to determine whether a groundwater to surface water migration pathway exists.

- Sampling of surface water and sediment at or below PPE may provide information regarding release to the surface water migration pathway.

- A complete geophysical survey, excavation of trenches to determine the number of drums, and collection of additional environmental samples from the site and neighboring properties would provide information to better characterize the extent of contamination. A removal action may be considered if the data from the above investigation indicate the presence of significant amount of waste on-site.

REFERENCES

1. Carlson, Bob, Environmental Specialist II, Missouri Department of Natural Resources, St. Louis Regional Office, July 21, 1989, Potential Hazardous Waste Site Inspection Report on Deer Valley Site, St. Louis County, Missouri.

2. Metcalf and Associates, February 1989, Remedial Investigation on Deer Valley Site, Florissant, MO.

3. Jaquess, Jeff, Missouri Department of Natural Resources, November 16, 1993, telephone conversation with Tom Sanders, Jacobs Engineering Group Inc.

4. Missouri Department of Natural Resources, November 17, 1993, Information on Well Distribution System.

5. U.S.Geological Survey, Water-Data Report MO-92-1, Water Resources Data, Missouri, Water Year 1992.

6. Borgwordt, Cindy, Missouri Department of Conservation, November 16, 1993, telephone conversation with Tom Sanders, Jacobs Engineering Group Inc.

7. Missouri Department of Conservation, December 14, 1993, Correspondence to Tom Sanders, Jacobs Engineering Group Inc.

8. U. S. Environmental Protection Agency, 1989, Graphic Exposure Modeling System database, Washington D.C., Deer Valley Site.

9. Missouri Department of Conservation, August 4, 1988, Correspondence to Mr. Donald Maddox, Regional Administrator, Missouri Department of Natural Resources, St. Louis, Missouri.

10. Employee, Whiting Roll-up Doors, December 16, 1993, telephone conversation with Tom Sanders, Jacobs Engineering Group Inc.

11. U.S.Geological Survey, 7.5-minute topographic quadrangle maps of Missouri; Florissant; Columbia Bottom; Clayton; and Granite City.

12. Miller, Don, et al., Water Resources Report No. 30, Water Resources, St. Louis Area, Missouri.

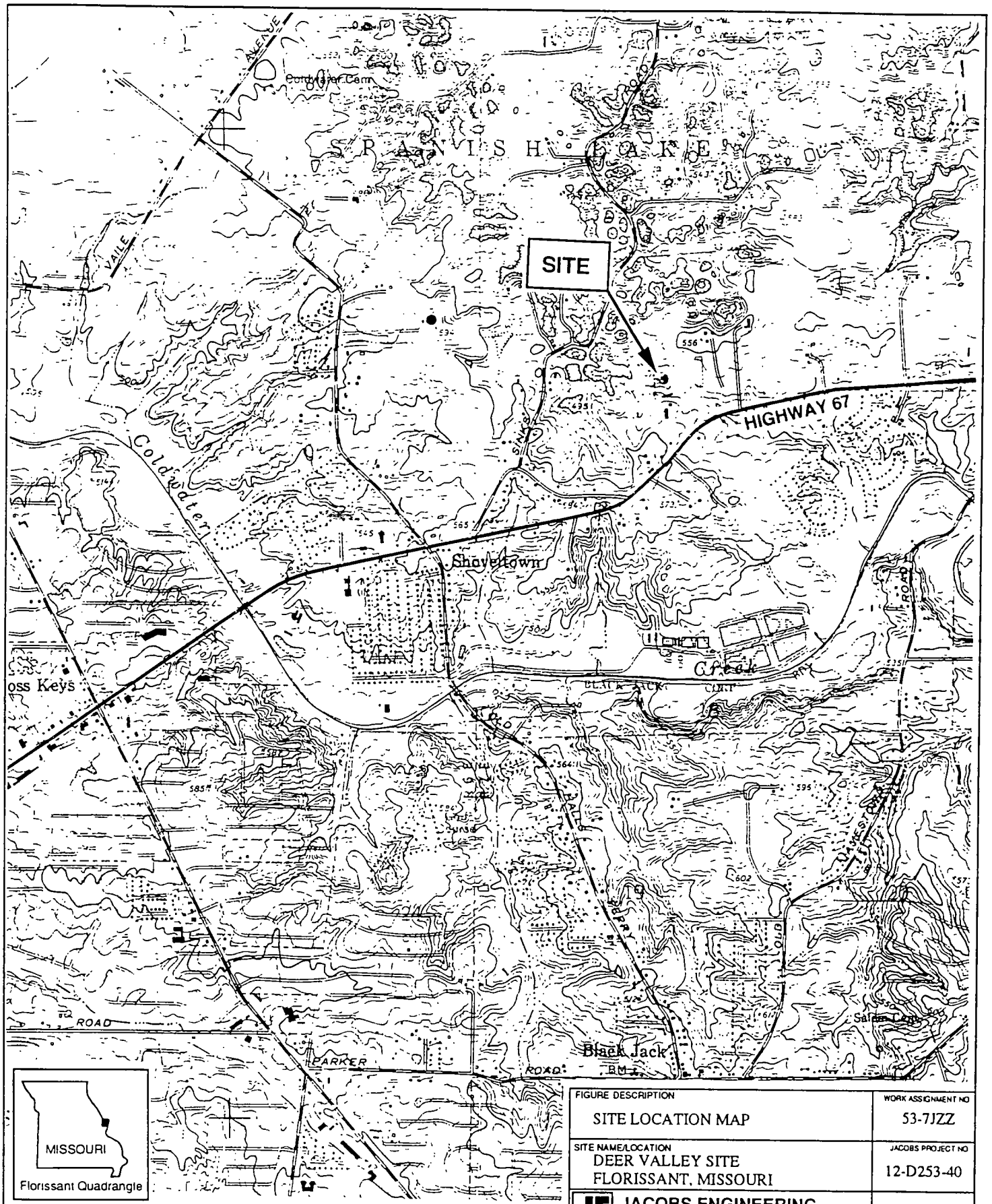
13. Madras, John, Environmental Specialist, Missouri Department of Natural Resources, September 12, 1989, Comments on Site Inspection Report of Deer Valley Site, St. Louis County, Missouri.

14. Sorell, Cheryl, Data Specialist, U.S.Census Bureau, November 8, 1993, telephone conversation with Samuel Mudumala, TapanAm Associates Inc.

15. Young, John, Director, Division of Environmental Quality, Missouri Department of Natural Resources, March 26, 1993, Correspondence to David Shorr, Director, Missouri Department of Natural Resources.

16. Metcalf and Associates, Inc., June 1992, Remedial Investigation Plan on Deer Valley Site, Florissant, Missouri.

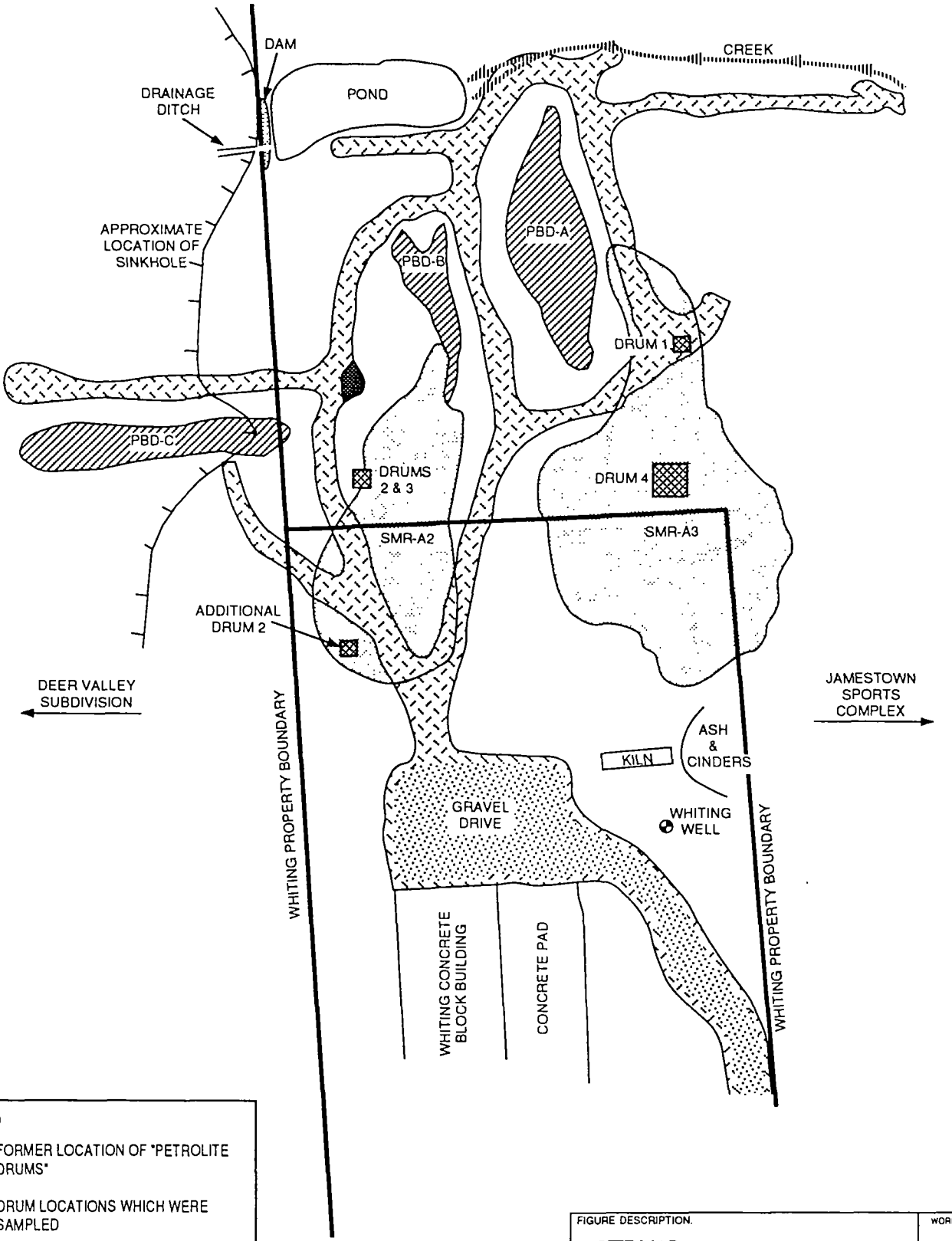
FIGURES



Source: U.S.G.S. Topographic Map

FIGURE DESCRIPTION: SITE LOCATION MAP	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 01/07/94	FIGURE NO: 1
CHECKED BY: TS DATE: 01/07/94	

D253-40-001



LEGEND

- FORMER LOCATION OF "PETROLITE DRUMS"
- DRUM LOCATIONS WHICH WERE SAMPLED
- ROADS CREATED FOR RI
- PARTIALLY BURIED DRUMS (PBD)
- SUBSURFACE METAL READINGS (SMR)

N

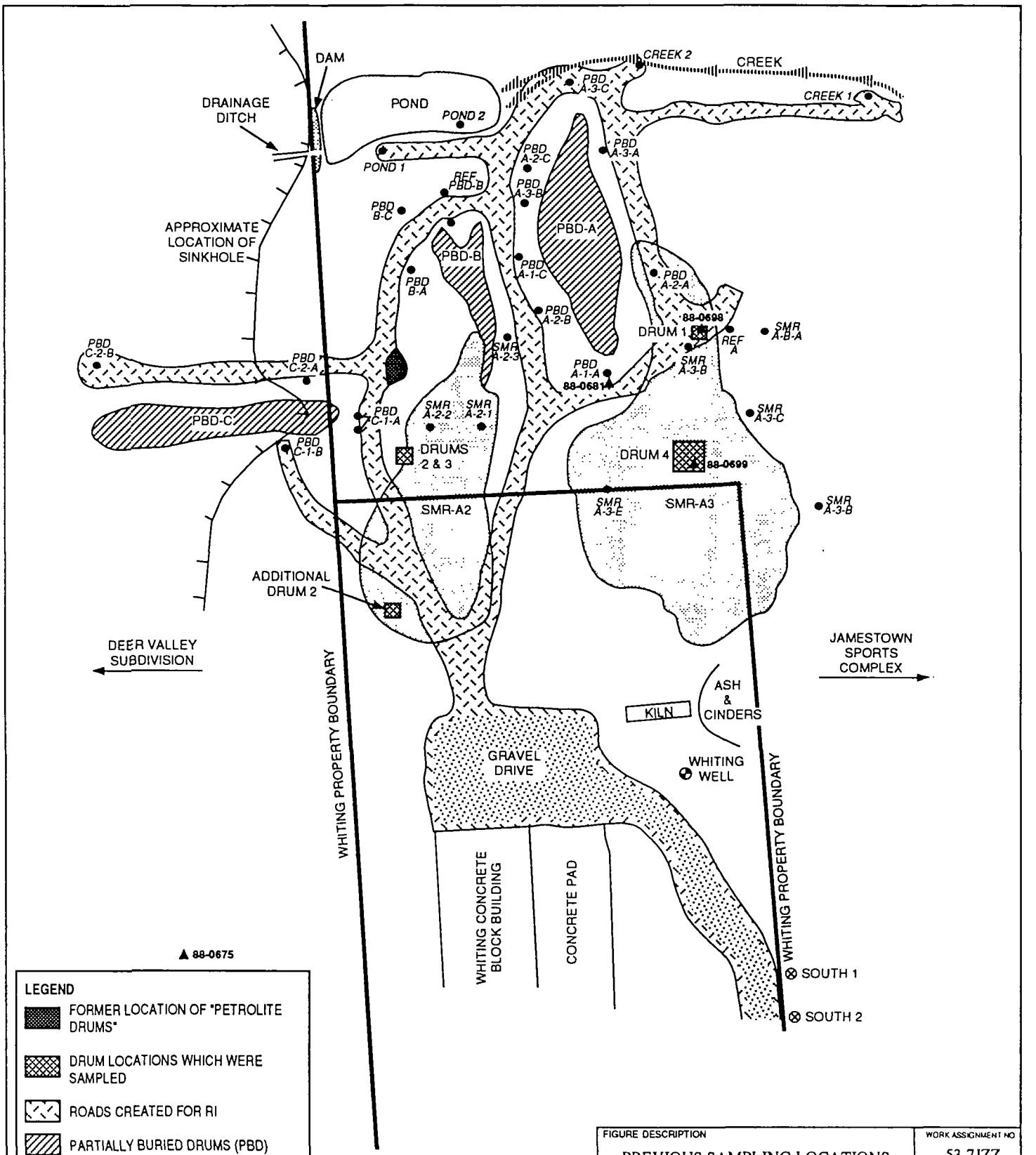
0 320

Approximate Scale in Feet

Source: Metcalf & Associates RI Report, 1989

FIGURE DESCRIPTION: SITE MAP	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 06/10/94	FIGURE NO: 2
CHECKED BY: TS DATE: 06/10/94	

D253-40-002



Source: Metcalf & Associates RI Report, 1989

FIGURE DESCRIPTION: PREVIOUS SAMPLING LOCATIONS	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 06/10/94	FIGURE NO: 3
CHECKED BY: TS DATE: 06/10/94	

D253-40-002

FIGURE DESCRIPTION: FOUR-MILE RADIUS MAP	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 01/07/94	FIGURE NO: 4
CHECKED BY: TS DATE: 01/07/94	

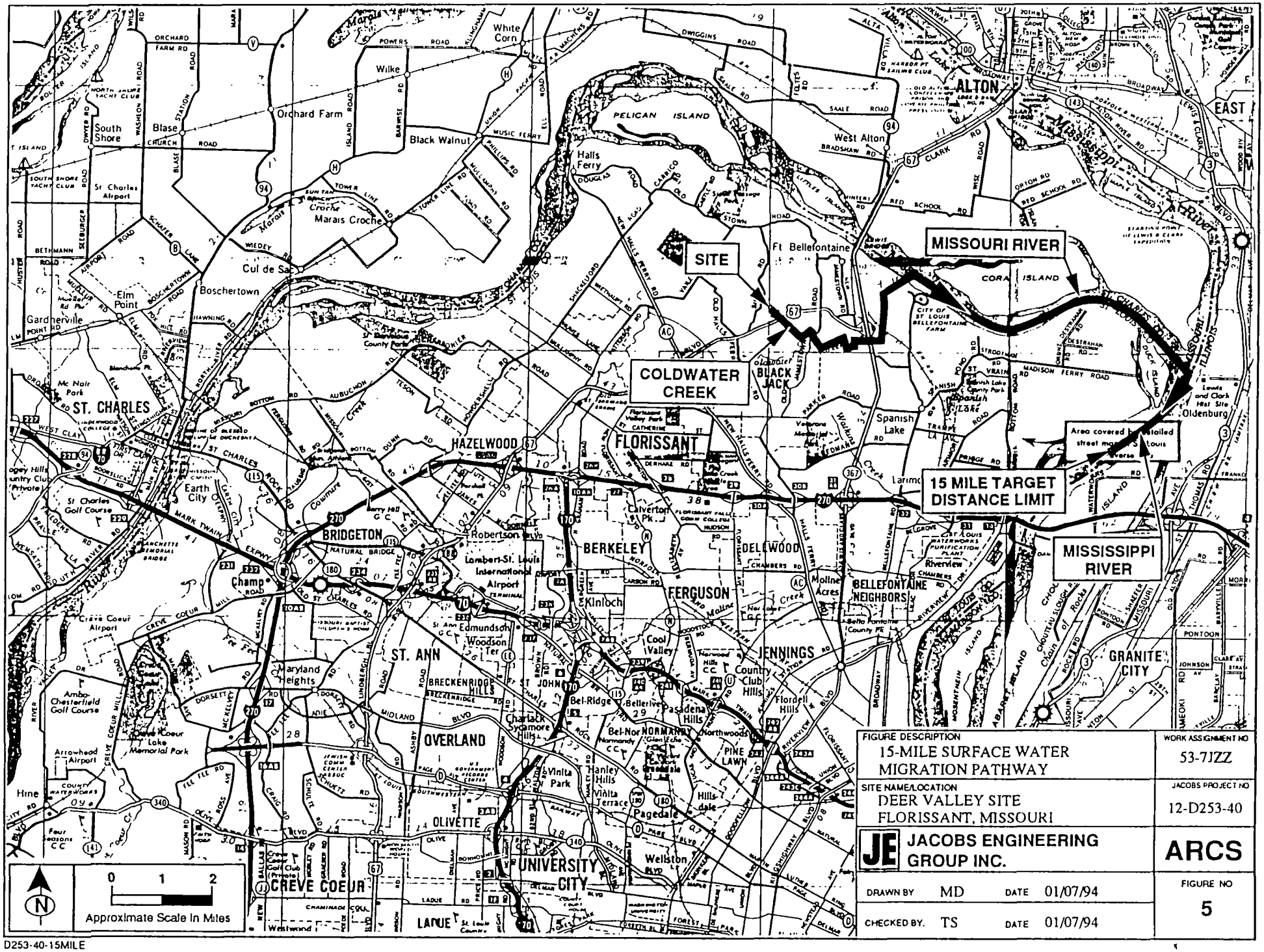


FIGURE DESCRIPTION: 15-MILE SURFACE WATER MIGRATION PATHWAY	WORK ASSIGNMENT NO: 53-7JZZ
SITE NAME/LOCATION: DEER VALLEY SITE, FLORISSANT, MISSOURI	JACOBS PROJECT NO: 12-D253-40
JACOBS ENGINEERING GROUP INC.	ARCS
DRAWN BY: MD DATE: 01/07/94	FIGURE NO: 5
CHECKED BY: TS DATE: 01/07/94	

D253-40-15MILE

TABLES

TABLE 1
MAXIMUM DETECTED CONCENTRATIONS IN SOIL (mg/kg)
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011
SEPTEMBER 1988

MDNR/PRP Sample Number	PRP Sample Location	Depth (in feet bgs)	CONTAMINANTS						
			Acetone	Cadmium	Chlordane	Chloroform	Ethylbenzene	Lead	Mercury
88-0698	Drum No. 1	NA	0.35	ND	ND	ND	ND	ND	ND
88-0699	Drum No. 1	NA	ND	ND	ND	ND	2.50	ND	ND
PBD-C-1-U	Composite Soil	0 to 6	ND	4.30	ND	ND	ND	231.00	2.60
PBD-C-2-U	Composite Soil	0 to 6	ND	ND	1.00	ND	ND	ND	ND
PBD-G1-B	Composite Soil	6 to 12	ND	ND	ND	29.00	ND	ND	ND
88-0681	Composite Soil	6 to 12	ND	ND	ND	ND	ND	ND	ND
88-0675	Background Level	6 to 12	ND	ND	ND	ND	ND	ND	ND
Health-Based Bench Marks	EPA Reference Dose Screening Concentration	NA	5.8E+04	2.90E+02	3.50E+01	5.80E+03	5.80E+04	NL	1.70E+02
	EPA Cancer Risk Screening Concentration	NA	NL	NL	4.50E-01	9.60E+01	NL	NL	NL
	EPA Proposed RCRA Soil Action Level	NA	8.00E+03	4.00E+01	5.0E-01	1.00E+02	8.00E+03	NL	2.00E+01
	EPA Carcinogenicity Classification	NA	D	B1	B2	B2	D	B2	D

Note: All concentrations reported in ppb unless noted in table. Locations are shown in Figure 3.

- Shaded data exceed at least one of the listed Regulatory Levels.

NL - Not listed

ND - Nont Detected

A - Human carcinogen

B - Probable human carcinogen

B1 - Limited evidence of carcinogenicity

B2 - Sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans

C - Possible human carcinogen (limited evidence of carcinogenicity in animals or lack of human data)

D - Not classifiable as to human carcinogenicity

TABLE 1 (Continued)
MAXIMUM DETECTED CONCENTRATIONS IN SOIL (mg/kg)
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011
SEPTEMBER 1988

MDNR/PRP Sample Number	PRP Sample Location	Depth (in feet bgs)	CONTAMINANTS				
			Methylene-Chloride	Styrene	Toluene	Trichloroethylene	Vinyl-Chloride
88-0698	Drum No. 1	NA	ND	2.00	ND	ND	ND
88-0699	Drum No. 1	NA	ND	ND	ND	6,900	ND
PBD-C-1-U	Composite Soil	0 to 6	ND	ND	ND	ND	ND
PBD-C-2-U	Composite Soil	0 to 6	ND	ND	ND	ND	ND
PBD-G1-B	Composite Soil	6 to 12	ND	ND	ND	ND	ND
88-0681	Composite Soil	6 to 12	ND	ND	0.39	ND	ND
88-0675	Background Level	6 to 12	1,000	ND	ND	ND	ND
Health-Based Bench Marks	EPA Reference Dose Screening Concentration	NA	3.50E+0.0	1.25E+0.0	1.25E+0.0	NL	NL
	EPA Cancer Risk Screening Concentration	NA	7.80E-0.3	NL	NL	5.30E+01	3.10E-01
	EPA Proposed RCRA Soil Action Level	NA	9.00E+01	2.00E+02	2.00E+02	6.00E+01	NL
	EPA Carcinogenicity Classification	NA	B	C	C	B2	A

TABLE 2
MAXIMUM DETECTED CONCENTRATIONS IN GROUNDWATER (mg/L)
DEER VALLEY SITE
FLORISSANT, MISSOURI
CERCLIS NO. MOD981712011
SEPTEMBER 1988

		CONTAMINANTS			
EPA Sample Number	**EPA Sample Location**	**Barium**	**Carbon Disulfide**	**1,1-Dichloroethane**	**Vinyl Chloride**
10/27 C	Deer Valley Well 10/27	1.87	ND	ND	ND
88-1758	Whiting Well	ND	0.12	0.0055	0.0051
Health-Based Bench Marks	MCL	2.0E+3.0	NL	NL	2
	MCLG	2.0E+3.0	NL	NL	0
	SMCL	NL	NL	NL	NL
	EPA Reference Dose Screening Concentration	2.50E+00	2.50E+00	3.50E+01	5.80E+03
	EPA Cancer Risk Screening Concentration	NL	NL	NL	18E+0.5
	EPA Carcinogenicity Classification	D	D	NL	A

Note: All concentrations reported in ppb unless noted in table. Locations are shown in Figure 3.

NL - Not listed
ND - Not Detected
A - Human carcinogen
B - Probable human carcinogen
B1 - Limited evidence of carcinogenicity
B2 - Sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans
C - Possible human carcinogen (limited evidence of carcinogenicity in animals or lack of human data)
D - Not classifiable as to human carcinogenicity

APPENDICES

APPENDIX A

PA Scoresheets

OMB Approval Number: 2050-0095
Approved for Use Through: 4/95

PA-Score

PA Scoresheets

Site Name: Deer Valley Site
CERCLIS ID No.: MOD98172011
Street Address: 5015 N. Hwy 67
City/State/Zip: Florissant, MO 63110

Investigator: Tom Sanders
Agency/Organization: Jacobs Engineering Group Inc
Street Address: 8208 Melrose Drive
City/State: Lenexa, KS

Date: 06-02-94

WASTE CHARACTERISTICS

Waste Characteristics (WC) Calculations:

1 Deer Valley Drums	Drums	WQ value	maximum
Volume	5.00E+02 drums	5.00E+01	5.00E+01
2 Contaminated soil	Contaminated soil	WQ value	maximum
Area	2.53E+01 acres	3.24E+01	3.24E+01

WQ total 8.24E+01

** Only First WC Page Is Printed **

Waste Characteristics Score: WC = 18

Ground Water Pathway Criteria List
Suspected Release

Are sources poorly contained? (y/n/u)	Y
Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	N
Is precipitation heavy? (y/n/u)	Y
Is the infiltration rate high? (y/n/u)	Y
Is the site located in an area of karst terrain? (y/n)	Y
Is the subsurface highly permeable or conductive? (y/n/u)	Y
Is drinking water drawn from a shallow aquifer? (y/n/u)	N
Are suspected contaminants highly mobile in ground water? (y/n/u)	Y
Does analytical or circumstantial evidence suggest ground water contamination? (y/n/u)	Y

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

Several drums were observed on-site by MDNR during the December 1986 investigation. Some of these drums were completely filled with unknown chemicals and some of these drums were partially full. Some of these drums were intact and some of them were ruptured. Water and soil samples indicated the presence of contaminants.

Ground Water Pathway Criteria List
Primary Targets

Is any drinking water well nearby? (y/n/u)	N
Has any nearby drinking water well been closed? (y/n/u)	N
Has any nearby drinking water well user reported foul-testing or foul-smelling water? (y/n/u)	N
Does any nearby well have a large drawdown/high production rate? (y/n/u)	N
Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance? (y/n/u)	N
Does analytical or circumstantial evidence suggest contamination at a drinking water well? (y/n/u)	N
Does any drinking water well warrant sampling? (y/n/u)	N
Other criteria? (y/n)	N
PRIMARY TARGET(S) IDENTIFIED? (y/n)	N

Summarize the rationale for Primary Targets:

The groundwater wells are generally used for industrial purposes. No drinking water wells are present within the target distance limit.

GROUND WATER PATHWAY SCORESHEETS

Pathway Characteristics

		Ref.
Do you suspect a release? (y/n)	Yes	
Is the site located in karst terrain? (y/n)	Yes	
Depth to aquifer (feet):	65	
Distance to the nearest drinking water well (feet):	0	

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION Are any wells part of a blended system? (y/n) N	0	0	
5. NEAREST WELL	0	0	
6. WELLHEAD PROTECTION AREA None within 4 Miles	0	0	
7. RESOURCES	5	0	
T =	5	0	

WASTE CHARACTERISTICS

WC =	18	0

GROUND WATER PATHWAY SCORE: 1

Ground Water Target Populations

Primary Target Population Drinking Water Well ID	Dist. (miles)	Population Served	Reference	Value
None				

*** Note : Maximum of 5 Wells Are Printed *** Total

Secondary Target Population Distance Categories	Population Served	Reference	Value
0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
		Total	0

Apportionment Documentation for a Blended System

Surface Water Pathway Criteria List Suspected Release	
Is surface water nearby? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	N
Is the drainage area large? (y/n/u)	Y
Is rainfall heavy? (y/n/u)	Y
Is the infiltration rate low? (y/n/u)	N
Are sources poorly contained or prone to runoff or flooding? (y/n/u)	Y
Is a runoff route well defined(e.g.ditch/channel to surf.water)? (y/n/u)	Y
Is vegetation stressed along the probable runoff path? (y/n/u)	U
Are sediments or water unnaturally discolored? (y/n/u)	U
Is wildlife unnaturally absent? (y/n/u)	U
Has deposition of waste into surface water been observed? (y/n/u)	N
Is ground water discharge to surface water likely? (y/n/u)	Y
Does analytical/circumstantial evidence suggest S.W. contam? (y/n/u)	N
Other criteria? (y/n) N	
SUSPECTED RELEASE? (y/n)	N

Summarize the rationale for Suspected Release:

The surface water is suspected to discharge into the sinkhole complex in the vicinity of the site; however, the exact location of sinkhole complex is not known. The area geology indicates the presence of karst features beneath the site.

Surface Water Pathway Criteria List
Primary Targets

Is any target nearby? (y/n/u) If yes: Y
- N Drinking water intake
- Y Fishery
- N Sensitive environment

Has any intake, fishery, or recreational area been closed? (y/n/u) N

Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target? (y/n/u) N

Does any target warrant sampling? (y/n/u) If yes: N
- N Drinking water intake
- N Fishery
- N Sensitive environment

Other criteria? (y/n) N

PRIMARY INTAKE(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Intakes:

No primary intakes were identified.

continued -------

continued -------

Other criteria? (y/n) N

PRIMARY FISHERY(IES) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Fisheries:

No primary fisheries were identified.

Other criteria? (y/n) N

PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Sensitive Environments:

No primary sensitive environments were identified within the target distance limit.

SURFACE WATER PATHWAY SCORESHEETS

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	No	
Distance to surface water (feet):	4000	
Flood frequency (years):	>500	
What is the downstream distance (miles) to: a. the nearest drinking water intake? b. the nearest fishery? c. the nearest sensitive environment?	 0.0 0.8 0.0	

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	0		
2. NO SUSPECTED RELEASE		100	
LR =	0	100	

Drinking Water Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
3. Determine the water body type, flow (if applicable), and number of people served by each drinking water intake.			
4. PRIMARY TARGET POPULATION 0 person(s)	0		
5. SECONDARY TARGET POPULATION Are any intakes part of a blended system? (y/n): N	0	0	
6. NEAREST INTAKE	0	0	
7. RESOURCES	0	5	
T =	0	5	

Drinking Water Threat Target Populations

Intake Name	Primary (y/n)	Water Body Type/Flow	Population Served	Ref.	Value
None					

Total Primary Target Population Value	0
Total Secondary Target Population Value	0

*** Note : Maximum of 6 Intakes Are Printed ***

Apportionment Documentation for a Blended System

Human Food Chain Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
8. Determine the water body type and flow for each fishery within the target limit.			
9. PRIMARY FISHERIES	0		
10. SECONDARY FISHERIES	0	30	
T =	0	30	

Human Food Chain Threat Targets

Fishery Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Coldwater Creek	N	10-100 cfs		30
2 Mississippi River	N	>10000 cfs		12
3 Missouri River	N	>10000 cfs		12

Total Primary Fisheries Value 0
Total Secondary Fisheries Value 0

*** Note : Maximum of 6 Fisheries Are Printed ***

Environmental Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
11. Determine the water body type and flow (if applicable) for each sensitive environment.			
12. PRIMARY SENSITIVE ENVIRONMENTS	0		
13. SECONDARY SENSITIVE ENVIRONS.	0	10	
T =	0	10	

Environmental Threat Targets

Sensitive Environment Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Mississippi River	N	>10000 cfs		0
2 Missouri River	N	>10000 cfs		0

Total Primary Sensitive Environments Value 0
Total Secondary Sensitive Environments Value 0
*** Note: Maximum of 6 Sensitive Environments Are Printed ***

Surface Water Pathway Threat Scores

Threat	Likelihood of Release(LR) Score	Targets(T) Score	Pathway Waste Characteristics (WC) Score	Threat Score LR x T x WC / 82,500
Drinking Water	100	5	18	0
Human Food Chain	100	30	18	1
Environmental	100	10	18	0

SURFACE WATER PATHWAY SCORE: 1

Soil Exposure Pathway Criteria List
Resident Population

Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination? (y/n/u)	N
Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator? (y/n/u)	N
Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities? (y/n/u)	N
Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems? (y/n/u)	N
Does any neighboring property warrant sampling? (y/n/u)	U

Other criteria? (y/n) N

RESIDENT POPULATION IDENTIFIED? (y/n) N

Summarize the rationale for Resident Population:

No resident population was identified.

SOIL EXPOSURE PATHWAY SCORESHEETS

Pathway Characteristics

		Ref.
Do any people live on or within 200 ft of areas of suspected contamination? (y/n)	No	
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination? (y/n)	No	
Is the facility active? (y/n):	Yes	

LIKELIHOOD OF EXPOSURE	Suspected Contamination	References
1. SUSPECTED CONTAMINATION LE =	550	

Targets

2. RESIDENT POPULATION 0 resident(s) 0 school/daycare student(s)	0	
3. RESIDENT INDIVIDUAL	0	
4. WORKERS 1 - 100	5	
5. TERRES. SENSITIVE ENVIRONMENTS	0	
6. RESOURCES	5	
T =	10	

WASTE CHARACTERISTICS

WC = 18

RESIDENT POPULATION THREAT SCORE: 1

NEARBY POPULATION THREAT SCORE: 1

Population Within 1 Mile: 1 - 10,000

SOIL EXPOSURE PATHWAY SCORE: 2

Soil Exposure Pathway Terrestrial Sensitive Environments

Terrestrial Sensitive Environment Name	Reference	Value
None		

Total Terrestrial Sensitive Environments Value

*** Note : Maximum of 7 Sensitive Environments Are Printed ***

Air Pathway Criteria List
Suspected Release

Are odors currently reported? (y/n/u)	N
Has release of a hazardous substance to the air been directly observed? (y/n/u)	N
Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air? (y/n/u)	N
Does analytical/circumstantial evidence suggest release to air? (y/n/u)	N
Other criteria? (y/n) N	
SUSPECTED RELEASE? (y/n)	N

Summarize the rationale for Suspected Release:

A release to the air was not suspected since the waste is buried and also based on the nature of the contaminants.

AIR PATHWAY SCORESHEETS

Pathway Characteristics

		Ref.
Do you suspect a release? (y/n)	No	
Distance to the nearest individual (feet):	0	

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	0		
2. NO SUSPECTED RELEASE		500	
LR =	0	500	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION	0	32	
5. NEAREST INDIVIDUAL	0	20	
6. PRIMARY SENSITIVE ENVIRONS.	0		
7. SECONDARY SENSITIVE ENVIRONS.	0	0	
8. RESOURCES	0	5	
T =	0	57	

WASTE CHARACTERISTICS

WC =	0	18

AIR PATHWAY SCORE:	6

Air Pathway Secondary Target Populations

Distance Categories	Population	References	Value
Onsite	0		0
Greater than 0 to 1/4 mile	15		1
Greater than 1/4 to 1/2 mile	2974		9
Greater than 1/2 to 1 mile	1487		3
Greater than 1 to 2 miles	10796		8
Greater than 2 to 3 miles	29942		4
Greater than 3 to 4 miles	47055		7
		Total Secondary Population Value	32

Air Pathway Primary Sensitive Environments

Sensitive Environment Name	Reference	Value
None		

Total Primary Sensitive Environments Value

*** Note : Maximum of 7 Sensitive Environments Are Printed***

Air Pathway Secondary Sensitive Environments

Sensitive Environment Name	Distance	Reference	Value
None			

Total Secondary Sensitive Environments Value

SITE SCORE CALCULATION	SCORE
GROUND WATER PATHWAY SCORE:	1
SURFACE WATER PATHWAY SCORE:	1
SOIL EXPOSURE PATHWAY SCORE:	2
AIR PATHWAY SCORE:	6
SITE SCORE:	3

SUMMARY

1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water? No

   If yes, identify the well(s).

   If yes, how many people are served by the threatened well(s)? 0

2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?
   A. Drinking water intake No
   B. Fishery No
   C. Sensitive environment (wetland, critical habitat, others) No

   If yes, identity the target(s).

3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility? No

   If yes, identify the properties and estimate the associated population(s)

4. Are there public health concerns at this site that are not addressed by PA scoring considerations? Yes

   If yes, explain:
   Presence of buried drums with unknown contents

REFERENCE LIST

APPENDIX B

Reference Cover Sheets

REFERENCE 1

POTENTIAL HAZARDOUS WASTE SITE

SITE INSPECTION REPORT

Deer Valley Site
St. Louis County, Missouri

Prepared by:

Bob Carlson
Environmental Specialist II
Missouri Department of Natural Resources
St. Louis Regional Office

Reference 2

METCALF
AND ASSOCIATES

REMEDIAL INVESTIGATION

DEER VALLEY SITE

5015 NORTH HIGHWAY 67

FLORISSANT, MO

FEBRUARY, 1989

217 North Second Street St. Charles, Missouri 63301 314-946-4499

REFERENCE 3

Jacobs Engineering Group Inc.
Kansas City Operations

Telephone Conversation Record

Date/Time of Call	11-16-93	☐ Incoming	☒ Outgoing
Recorded By:	Signature (required for HRS related TCRs)	Title:	SITE MGR (Project Manager, Site Manager, etc.)
Jacobs Project No./WBS	12D25340(511)	Client:	EPA
Person Contacted (Name, Title)	~~EVAN~~ ~~KEFFER~~ JEFF JAQUESS	Phone No.	314-368-2165
Person Contacted (Organization/Agency)	MDNR		
Subject:	WELLHEAD PROTECTION AREA		

Conversation Summary

Jacobs (Questions/Replies)	Contact (Questions/Replies)
1.) COULD YOU (JEFF JAQUESS) TELL ME IF THERE IS A WELLHEAD PROTECTION AREA WITHIN 4 miles OF T.47N R7E, SEC 7.?	1.) YES, BUT I'LL HAVE TO CHECK AROUND, IF YOU COULD HOLD ON FOR A MINUTE.
	2) MR. SANDERS, IN CHECKING FILES AND WITH THE CITY OF FLORISSANT THERE ARE NO WELLHEAD PROTECTION AREAS WITHIN 4 miles. THE FEW WELLS IN THE AREA ARE COMMERCIAL OR INDUSTRIAL.
2. THANK YOU FOR YOUR TIME AND INFORMATION.	

Action Items	Due Date
1 NONE	
2	

pwssid	pwssname	rivname	cencounty	rivmile	long	lat
6182215	Union Electric - Souix Plant	Mississippi River	St. Charles	0	-90.29259	38.92065
6010913	St. Louis Co. Water Co. - North	Missouri River	St. Louis	20.5	-90.37199	38.82109
6010927	St. Louis City - Chain of Rocks	Mississippi River	St. Louis City	190.5	-90.17673	38.75842
6010911	St. Louis Co. Water Co. - Central	Missouri River	St. Louis	36	-90.53375	38.68995
6010928	St. Louis City - Howard Bend	Missouri River	St. Louis	37	-90.54539	38.68195
6010430	Kirkwood	Meramec River	St. Louis	1.2	-90.44224	38.55957
6182216	Union Electric - Labadie Plant	Missouri River	Franklin	0	-90.83678	38.56583
6010912	St. Louis Co. Water Co. - South	Meramec River	St. Louis	0	-90.43416	38.51444
6024293	Jefferson Co. PWSD #2	Big River	Jefferson	0	-90.5869	38.46832
6010962	St. Louis Co. Water Co. - Meramec	Meramec River	St. Louis	0	-90.37385	38.45353
6182217	Union Electric - Rush Island Plant	Mississippi River	Jefferson	0	-90.26128	38.13424

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
Mel Carnahan, Governor • David A. Shorr, Director
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

RECYCLED PAPER

Sorry -
Printed on letterhead.

long	lat	county	mapname	pwsname	pwsid	wellnum	drilldate	material	totdepth	casedepth
-90.34034	38.92451	St Charles	Elsah (IL)	Portage Des Sioux	6010657	1				
-90.44803	38.89887	St Charles	Grafton (Il.)	Orchard Farm Schools	6171218	1				
-90.73702	38.85365	St Charles	O'Fallon	Tara Oaks Subd.	6036136	1				
-90.52964	38.82668	St Charles	Kampville	St. Charles	6010707	7				
-90.52969	38.82559	St Charles	Kampville	St. Charles	6010707	6		Gravel Wall	114	79'--5'--35'
-90.52966	38.82448	St Charles	Kampville	St. Charles	6010707	5		Gravel Wall	110	75'--35'
-90.52972	38.82334	St Charles	Kampville	St. Charles	6010707	4	69	Gravel Wall	116	81'--35'
-90.52966	38.82126	St Charles	Kampville	St. Charles	6010707	1	62	Gravel Wall	120	86'--35'
-90.5984	38.81875	St Charles	Kampville	St. Peters	6010719	3	72	C	70	
-90.5998	38.8178	St Charles	Kampville	St. Peters	6010719	6	76	C	75	
-90.59146	38.81762	St Charles	Kampville	St. Peters	6010719	8				
-90.59768	38.81757	St Charles	Kampville	St. Peters	6010719	5	74	C	65	
-90.70086	38.81852	St Charles	O'Fallon	O'Fallon	6010588	3				390'--12"
-90.59705	38.81628	St Charles	Kampville	St. Peters	6010719	9				
-90.59894	38.81627	St Charles	Kampville	St. Peters	6010719	7	77	C	75	
-90.75322	38.8171	St Charles	Wentzville	O'Fallon	6010588	6				
-90.66164	38.81353	St Charles	O'Fallon	MEMC - St. Peters	6180570	4				
-90.65939	38.81323	St Charles	O'Fallon	MEMC - St. Peters	6180570	1				
-90.65912	38.8128	St Charles	O'Fallon	MEMC - St. Peters	6180570	2				
-90.66096	38.811	St Charles	O'Fallon	MEMC - St. Peters	6180570	3				
-90.69791	38.81102	St Charles	O'Fallon	St. Mary's Institute	6069050	1				
-90.85078	38.81333	St Charles	Wentzville	Wentzville	6010849	2	42	C	1335	380
-90.95554	38.81483	St Charles	Foristell	Foristell	6010287	1				
-90.84411	38.81223	St Charles	Wentzville	Wentzville	6010849	4	66	C	1445	485
-90.83176	38.81084	St Charles	Wentzville	Wentzville	6010849	5				
-90.8562	38.8109	St Charles	Wentzville	Wentzville	6010849	1	36	C	814	250
-90.85051	38.81004	St Charles	Wentzville	Wentzville	6010849	3	47	C	1345	400
-90.69612	38.80701	St Charles	O'Fallon	O'Fallon	6010588	2				
-90.68366	38.80659	St Charles	O'Fallon	O'Fallon	6010588	5				
-90.71538	38.8057	St Charles	O'Fallon	O'Fallon	6010588	4		C	1497	448
-90.89027	38.80896	St Charles	Foristell	Cherokee Lakes Subd.	6036215	1	66	C	735	390
-90.6811	38.80171	St Charles	O'Fallon	Laclede MHP	6048001	1				
-90.89511	38.80456	St Charles	Foristell	7 Acres Motel & 7 Apts.	6192041	1				
-90.71855	38.8	St Charles	O'Fallon	King Arthurs Court MHP	6048010	1				
-90.90524	38.79812	St Charles	Foristell	Prairie View Acres Subd.	6036022	1	63	C	714	416
-90.75653	38.79034	St Charles	Wentzville	St. Charles Co. PWSD #2 - North	6024529	3	72	C	1450	467
-90.66029	38.77201	St Charles	O'Fallon	St. Jude's Subd	6036002	1	64	C	769	389
-90.86404	38.7754	St Charles	Wentzville	Castlegate Estates MHP	6048257	1				

-90.86133	38.77409	St Charles	Wentzville	St. Charles Co. PWSD #2 - East	6024530	5				
-90.74836	38.77185	St Charles	O'Fallon	St. Charles Co. PWSD #2 - North	6024529	2	70	C	1365	430
-90.71155	38.75848	St Charles	O'Fallon	St. Charles Co. PWSD #2 - North	6024529	4				
-90.52496	38.74202	St Charles	Chesterfield	Timberorest Subd.	6036024	1		C	343	50
-90.87743	38.71305	St Charles	New Melle	St. Charles Co. PWSD #2 - East	6024530	6				
-90.6851	38.70499	St Charles	Weldon Spring	Weldon Spring Heights Village	6010919	1	41	C	811	359
-90.73071	38.66346	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	1				
-90.73471	38.65948	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	2				
-90.73588	38.65709	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	3				
-90.73923	38.65641	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	5				
-90.74107	38.65395	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	6				
-90.74477	38.6536	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	8				
-90.73817	38.65279	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	4				
-90.7428	38.65093	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	7				
-90.74579	38.64869	St Charles	Weldon Spring	Weldon Spring Treatment Plant	6079507	9				
-90.86507	38.6003	St Charles	Labadie	St. Charles Co. PWSD #2 - West	6024531	1	74	C	1100	550
-90.45617	38.55557	St Louis	Kirkwood	Kirkwood	6010430	3				
-90.45699	38.55533	St Louis	Kirkwood	Kirkwood	6010430	2				
-91.02824	38.56591	Franklin	Washington West	Washington	6010838	3				
-90.4624	38.5541	St Louis	Kirkwood	Kirkwood	6010430	1	50		60	60
-90.587	38.55333	St Louis	Manchester	Whispering Oaks Health Care Center	6069015	1				
-90.51949	38.51166	St Louis	Manchester	Paradise Valley Subd	6036257	4				
-90.6455	38.50961	St Louis	Eureka	Eureka	6010258	3	66	C	840	
-90.5213	38.50574	St Louis	Manchester	Paradise Valley Subd	6036257	3				
-90.6608	38.5058	St Louis	Eureka	Eureka	6010258	1	58	C	808	197
-90.63277	38.50362	St Louis	Eureka	Eureka	6010258	5				
-90.65562	38.50178	St Louis	Eureka	Eureka	6010258	2	62	C	802	230
-90.70158	38.49583	St Louis	Pacific	Missouri Eastern Correctional Center	6069017	2				
-90.63584	38.49145	St Louis	Pacific	Eureka	6010258	4	72	C	1020	375
-90.70046	38.49188	St Louis	Pacific	Missouri Eastern Correctional Center	6069017	1				
-90.22688	38.86475	St Charles	Columbia Bottom	West Alton Elem. School	6171297	1				
-90.74296	38.86262	St Charles	O'Fallon	St. Paul's Elem. School	6171217	1				
-90.63566	38.65465	St Louis	Weldon Spring	Chesterfield Elem. School	6171791	1				

REFERENCE 5

Water Resources Data Missouri Water Year 1992

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MO-92-1

Prepared in cooperation with the Missouri Department of Natural Resources, Division of Geology and Land Survey and Division of Environmental Quality; Missouri State Highway and Transportation Commission; and with other State and Federal agencies

MISSOURI RIVER MAIN STEM

06934500 MISSOURI RIVER AT HERMANN, MO

LOCATION.--Lat 38°42'36", long 91°26'21", in SW ¼ sec.25, T.46 N., R.5 W., Montgomery County, Hydrologic Unit 10300200, on downstream side of third pier from right abutment of bridge on State Highway 19 at Hermann and at mile 97.9.

DRAINAGE AREA.--524,200 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1897 to current year. Prior to August 1928 monthly discharge only published in WSP 1310. Gage-height records 1873-99 collected at site 480 ft downstream are contained in reports of Missouri River Commission; since 1900 in reports of National Weather Service.

REVISED RECORDS.--WDR MO-76-1: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage. Datum of gage is 481.56 ft above sea level. Prior to Sept. 26, 1930, nonrecording gage at site 480 ft downstream at datum 0.07 ft lower; Sept. 26, 1930 to Mar. 27, 1932, nonrecording gage; Mar. 28, 1932 to June 12, 1945, water-stage recorder; June 13, 1945 to Apr. 2, 1946, May 13 to Sept. 30, 1978, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: June 20 and 21. Water-discharge records good. Discharge measurements made biweekly except during period of no navigation in winter months. Some regulation from many upstream reservoirs. National Weather Service gage-height and U.S. Army Corps of Engineers satellite telemeters at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1844 reached a stage of 35.5 ft, discharge, about 892,000 ft³/s, computed by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38700	43900	33300	37500	34000	54000	82700	102000	53300	48800	190000	54500
2	38200	50800	38000	38300	31600	44500	87900	93700	52400	48400	211000	56100
3	38600	48800	46000	37700	30800	41100	79000	86000	50400	55800	195000	60500
4	40100	46100	45800	43800	30700	39300	72200	77400	51300	50800	165000	58300
5	41400	43200	44700	44600	30700	38200	64700	71400	50900	48900	153000	61900
6	44600	41500	46300	40200	36000	37500	56800	70800	49100	46800	143000	77700
7	49300	36500	42400	39300	41300	39500	55200	72900	57600	46400	136000	75300
8	48300	32500	37400	42500	33400	44500	59300	66200	55700	51100	135000	73300
9	44900	30000	33900	43600	32700	46700	57500	59900	50300	61700	131000	90000
10	42600	28600	31500	43100	30500	62700	55400	56500	48900	74800	136000	105000
11	41600	27400	31600	43000	29200	71700	54900	54500	54900	76000	128000	105000
12	40900	26100	31100	43300	29700	66000	59000	53100	61600	84100	121000	89800
13	40200	24700	33900	40000	33600	61400	62400	54300	64700	84300	116000	80500
14	39900	23900	34000	37400	39000	58300	69300	52800	70600	74500	113000	76800
15	39800	23700	31800	37000	71000	52800	79900	52400	63000	120000	107000	76800
16	39700	23800	32600	42900	67200	48500	77800	51000	57100	189000	103000	77500
17	39300	23500	34900	44200	50800	49400	71900	50900	59700	180000	98600	74400
18	38900	28100	38300	41500	58600	51300	76900	51800	62100	161000	94800	84900
19	39000	37100	41100	36300	58600	52100	91600	49700	62500	152000	94500	110000
20	39100	41900	46500	35200	85200	63700	94400	49200	70000	135000	87500	118000
21	39200	45500	69300	34300	91700	108000	116000	50700	80000	133000	82200	113000
22	39700	47500	63000	32900	83200	123000	164000	52000	76400	146000	77200	116000
23	40100	44500	54800	32000	70100	106000	191000	63500	68500	143000	71500	117000
24	41100	41500	59000	40900	57500	86300	190000	69600	61300	142000	66300	94700
25	40700	35500	64200	43700	55300	75500	187000	64200	63800	142000	62800	78400
26	39400	33500	66800	41700	63800	73000	184000	61900	65500	156000	66000	67800
27	39100	32900	65900	36600	67200	64900	164000	61700	64000	191000	65200	64000
28	39600	31000	57500	35000	68300	64000	145000	60100	57000	241000	61400	60200
29	40400	29600	51900	36300	63100	63600	132000	58300	54000	222000	58600	57000
30	40300	30400	45200	37700	---	76900	119000	56100	51500	206000	56300	55000
31	40400	---	41200	37200	---	78800	---	53900	---	182000	54200	---
MEAN	40810	35130	44960	39350	50860	62680	100000	62210	59600	119100	109000	80980
MAX	49300	50800	69300	44600	91700	123000	191000	102000	80000	241000	211000	118000
MIN	38200	23500	31100	32000	29200	37500	54900	49200	48900	46400	54200	54500
IN.	.09	.07	.10	.09	.10	.14	.21	.14	.13	.26	.24	.17

STATISTICS OF MONTHLY MEAN DATA FOR PERIOD OF RECORD, BY WATER YEAR (WY)**

MEAN	63710	62890	47330	42380	56980	88740	113700	107000	119500	94770	60940	63390
MAX	286700	152700	178900	129000	136800	267500	333400	231400	320600	445200	130300	208900
(WY)	1987	1986	1983	1973	1982	1973	1973	1943	1935	1951	1951	1951
MIN	15170	16630	12110	6827	12280	22810	36490	31930	38770	33560	18200	21830
(WY)	1940	1940	1938	1940	1940	1964	1956	1934	1934	1936	1936	1937

SUMMARY STATISTICS**	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		FOR PERIOD OF RECORD	
ANNUAL MEAN	56960		67130		76780	
HIGHEST ANNUAL MEAN					140500	1973
LOWEST ANNUAL MEAN					29750	1934
HIGHEST DAILY MEAN	158000	Apr 20	241000	Jul 28	615000	Jul 19 1951
LOWEST DAILY MEAN	23500	Nov 17	23500	Nov 17	4200	Jan 10 1940
INSTANTANEOUS PEAK FLOW	--		249000	Jul 28	676000	Jun 6 1903
INSTANTANEOUS PEAK STAGE	--		23.08	Jul 28	35.79	Oct 5 1986
INSTANTANEOUS LOW FLOW	--		23300	Nov 17	4200	Jan 10 1940
ANNUAL SEVEN-DAY MINIMUM	24700	Nov 11	24700	Nov 11	4310	Jan 8 1940
ANNUAL RUNOFF (INCHES)	1.48		1.74		1.99	
10 PERCENT EXCEEDS	110000		122000		151000	
50 PERCENT EXCEEDS	43200		55500		57600	
90 PERCENT EXCEEDS	33700		34000		25600	

** Statistics based only on years with complete daily discharge record.

REFERENCE 6

Jacobs Engineering Group Inc.
Kansas City Operations

PAGE ____ OF ____

Telephone Conversation Record

Date/Time of Call	11-16-93 / 14:50	☐ Incoming	☒ Outgoing
Recorded By:	Signature (required for HRS related TCRs)	Title:	SITE MGR (Project Manager, Site Manager, etc.)
Jacobs Project No./WBS	12D25340 (511)	Client:	EPA
Person Contacted (Name, Title)	CINDY BORGWORAT	Phone No.	1-314-751-4115 Ext. 168
Person Contacted (Organization/Agency)	DEPT. OF CONSV, MO.		
Subject:	FISHERIES NEAR DEER VALLEY SITE		

Conversation Summary

Jacobs (Questions/Replies)	Contact (Questions/Replies)
1.) ARE THERE ANY FISHERIES NEAR THE COORDINATE T.47.N, R7E, SEC.7?	1.) YES, ALL ALONG MILL CREEK.
2.) DO THEY HAVE A SPECIFIC NAME AND DISTANCE FROM THE LOCATION GIVEN	2.) NO, I CAN ONLY TELL YOU THAT ALONG MILL CREEK IN THAT AREA IS A FISHERY. THERE IS RANDOM FISHING ALL ALONG COLD WATER AND THE MISSOURI.
3.) THANK YOU FOR YOUR INFORMATION.	

Action Items	Due Date
1	
2	

7

REFERENCE 7

December 14, 1993
Page: 1

Jacobs Engineering Group Inc.
Potential Hazardous Waste Sites
Deer Valley
Florissant, MO - St. Louis County

The following species and/or natural communities are known from the vicinity of the project site.

SCIENTIFIC NAME	COMMON NAME	FED STATUS	STATE STATUS	DATE	TOWN/RANGE	SEC	MANAGED AREA
SANDBAR			E	1980	048N006E	35	PELICAN ISLAND DESIGNATED NATURAL AREA
WET-MESIC BOTTOMLAND FOREST			R	1987	048N006E	35	PELICAN ISLAND DESIGNATED NATURAL AREA

Other Considerations.

Overwintering bald eagles may occur in the project area, as they are common winter residents in big river habitats and major lakes where they feed on fish.

Pallid sturgeons are big river fish that may range widely in the Mississippi River and Missouri River system. Because the current knowledge on the preferred habitat and range of the species is unknown, any project that modifies big river habitat or can impact water quality should consider the possible impact to pallid sturgeon populations.

FEDERAL STATUS - The federal status is derived from the provisions of the federal Endangered Species Act, which is administered by the U.S. Fish and Wildlife Service. The Endangered Species Act provides federal protection for plants and animals listed as Endangered or Threatened. E = Endangered T = Threatened A,B,C = Candidate for Federal listing.

MISSOURI STATUS - The state status is determined by the Department of Conservation under Constitutional authority. Rule 3CSR10-4.111 of the Wildlife Code of Missouri and certain state statutes apply to state listed species. E = Endangered R = Rare SU = Status Undetermined WL = Watch List EXT = Extirpated EXTINCT = No longer living anywhere.
Great blue heron rookeries, natural communities and geologic features may also occur on this printout. The status given these elements is provided for informational purposes only. C = Common, - = No status. These elements are not necessarily afforded protection through endangered species law or statute.

REFERENCE 8

KM	0.00-.400	.400-.800	.800-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	2974	1487	10796	29942	47055	92254
RING TOTALS	0	2974	1487	10796	29942	47055	92254

press RETURN to continue
MENU: Geodata Handling Data List procedures
1. Site level retrieval of data (SITERET) 2. Access Census Data (CENSUS) 3. Determine County Coverage (COVERAGE) 4. Geographic Data Management (GEODM) 5. HUCODE/SOIL locator (HUCODE) 6. Convert to Lat/Long (LATLON) 7. Lookup/Examine Star Station Data (STAR) 8. Find US cities (USCITY) 9. Find Soil Survey Status of Counties (SSURVEY) 10. 70, 80, 90, 95 Demographic Data Retrieval (SUPERPOP) Enter an option number or a procedure name (in parentheses)
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS>
C:\PCPLUS>

REFERENCE 9

MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS:
P.O. Box 180
Jefferson City, Missouri 65102-0180

9

STREET LOCATION:
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone: 314/751-4115
JERRY J. PRESLEY, Director

August 4, 1988

RECEIVED
AUG 08 1988
SLRO

RECEIVED
AUG 21 1989

Mr. F. Donald Maddox
Regional Administrator
Missouri Department of Natural Resources
8460 Watson Road, Suite 217
St. Louis, MO 63119

Dear Mr. Maddox:

In response to your July 21, 1988 letter requesting information relative to nine abandoned/uncontrolled hazardous waste sites in the St. Louis region, I am pleased to provide a response.

Site 1 - Missouri Metal Shaping: Mississippi kite (Ictinia mississippiensis) nest occurs within two miles of this site. This bird is rare in Missouri. The record is from 1987. We do not anticipate any impacts from activities at this site on this species. River des Peres is within a half mile of the site.

Site 2 - Tegethoff Landfill: There are no known rare or sensitive species near this site. The landfill is within a mile of Creve Coeur Lake, a wetland and park area.

Site 3 - Deer Valley Site: There are no known rare or sensitive species near this site. The site is within two miles of Missouri River and Coldwater Creek.

Site 4 - P. D. George Paint Company: Schweinitz's sedge (Carex schweinitzii), endangered in Missouri, was reported within one-half mile of this site in 1955. The site is located within one quarter mile of the Mississippi River.

Site 5 - National Lead Site: There are no known rare or sensitive species near this site. The site is in close proximity to River des Peres and within one-half mile of Forest Park.

Site 6 - Haynes Site: There are no known rare or sensitive species near this site. The site is within one-half mile of Little Indian Creek and two miles of Little Indian Creek State Forest.

Site: Deer Valley
ID #: MOD981760011
Break: 16.1
Other:
8-4-88

REFERENCE 10

Jacobs Engineering Group Inc.
Kansas City Operations

PAGE ____ OF ____

Telephone Conversation Record

Date/Time of Call	12/16/93 2:00pm	☐ Incoming	☒ Outgoing
Recorded By:	Signature (required for HRS related TCRs)	Title:	(Project Manager, Site Manager, etc.)
Jacobs Project No./WBS	12D25340 (511)	Client:	EPA
Person Contacted (Name, Title)	WHITING ROLL UP DOORS EMPLOYEE	Phone No.	314-741-
Person Contacted (Organization/Agency)			
Subject:	ON SITE EMPLOYEES		

Conversation Summary

Jacobs (Questions/Replies)	Contact (Questions/Replies)
1.) IS THIS WHITING ROLL UP DOORS AT 5015 N. HWY 67?	1.) YES.
2.) COULD YOU TELL ME HOW MANY PEOPLE WORK AT THAT FACILITY?	2.) 6 PEOPLE.
3.) THANK YOU FOR THE INFORMATION	

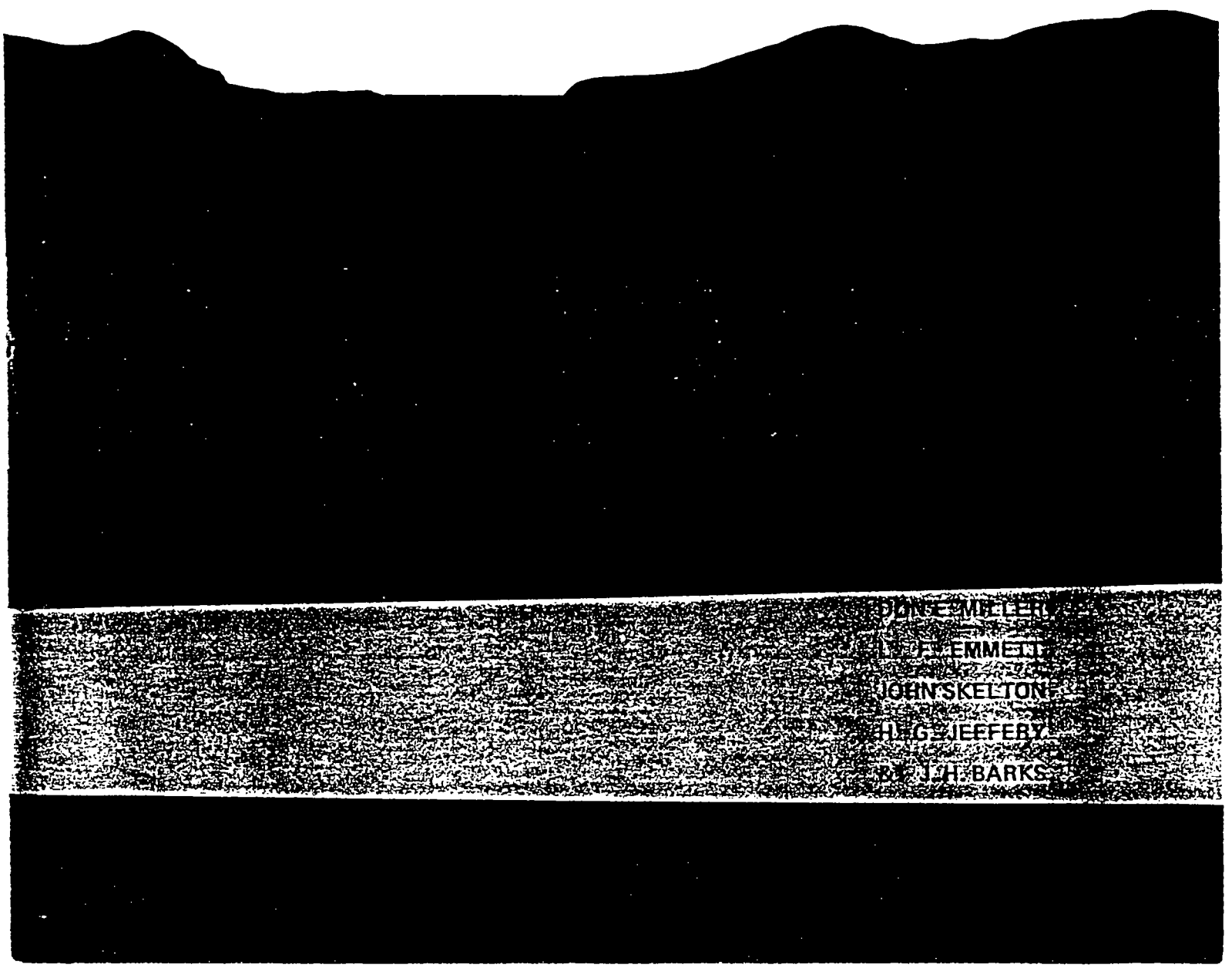
Action Items	Due Date
1	
2	

REFERENCE 12

WATER RESOURCES REPORT NO. 30

WATER RESOURCES

ST. LOUIS AREA MISSOURI



REFERENCE 15

JOHN ASHCROFT
Governor

G. TRACY MEHAN III
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Division of Parks, Recreation, and Historic Preservation

MEMORANDUM

DATE: September 12, 1989

TO: Deer Valley File, St. Louis County

FROM: Mr. John Madras, Environmental Specialist
Waste Management Program

SUBJECT: Comments on Site Inspection Report

1. This report documents the presence of hazardous substances and possibly hazardous wastes present on and in the Deer Valley site. The following table summarizes the hazardous substances found in sampling by the department or by Metcalf and Associates. The acetone, ethylbenzene and trichloroethylene may be considered hazardous waste if it is concluded that they were used as solvents. While significant concentrations of metals are present in the soil, none exceeds a Department of Health cleanup standard as determined for unrestricted use at other sites. Among the organic compounds detected, chlordane at 1 mg/kg is close to the standard set at Farmland (1.285 ppm), chloroform at 29 mg/kg exceeds the standard set at Riverfront Landfill (9.0 ppm) and vinyl chloride at 5.1 ug/l in the well exceeds the drinking water MCL of 1 ug/l.

2. The site history, the metal detector survey and aerial photographs suggest that more drums may be buried on-site than the four that were excavated during the inspection. The burial of metal door parts and other metallic debris, makes the location of other drums difficult. Extensive excavation would be necessary to reach a conclusion about the presence of drums still buried.

3. The preliminary Hazard Ranking Score (HRS) Score is 1.55, resulting from a lack of target populations (the groundwater is not used as drinking water supply). The site may present some on-site hazard, particularly if someone were to construct a foundation on the property.

4. The report suggests that more buried drums may be present and recommends further excavation. Based on the materials found during the site inspection, this appears warranted. Due to the low HRS score, and little possibility that it would rise significantly even if a large quantity of material were discovered, a removal action appears to be the appropriate procedure for further work.

REFERENCE 14

Jacobs Engineering Group Inc.
Kansas City Operations

PAGE 1 OF 1

Telephone Conversation Record

Date/Time of Call: 11/8/93 ; 12:05 PM ☐ Incoming ☒ Outgoing

Recorded By: SAMUEL MUDUMALA Title:

Jacobs Project No./WBS: 12D 25341 | 511 (Signature (required for HRS related TCRs) (Project Manager, Site Manager, etc.)) Client:

Person Contacted (Name, Title): Cheryl Sovell Data Specialist. Phone No.: 236-3711

Person Contacted (Organization/Agency): U.S. Census Bureau

Subject: St. Louis County, Missouri

Conversation Summary

Jacobs (Questions/Replies)	Contact (Questions/Replies)
Population of St. Louis County	993,522
No. of persons/household	2.57

Action Items	Due Date
1	
2	